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FURTHER LASER VELOCIMETER MEASUREMENTS OF SLENDER-BODY WAKE VOR--ETC(U)
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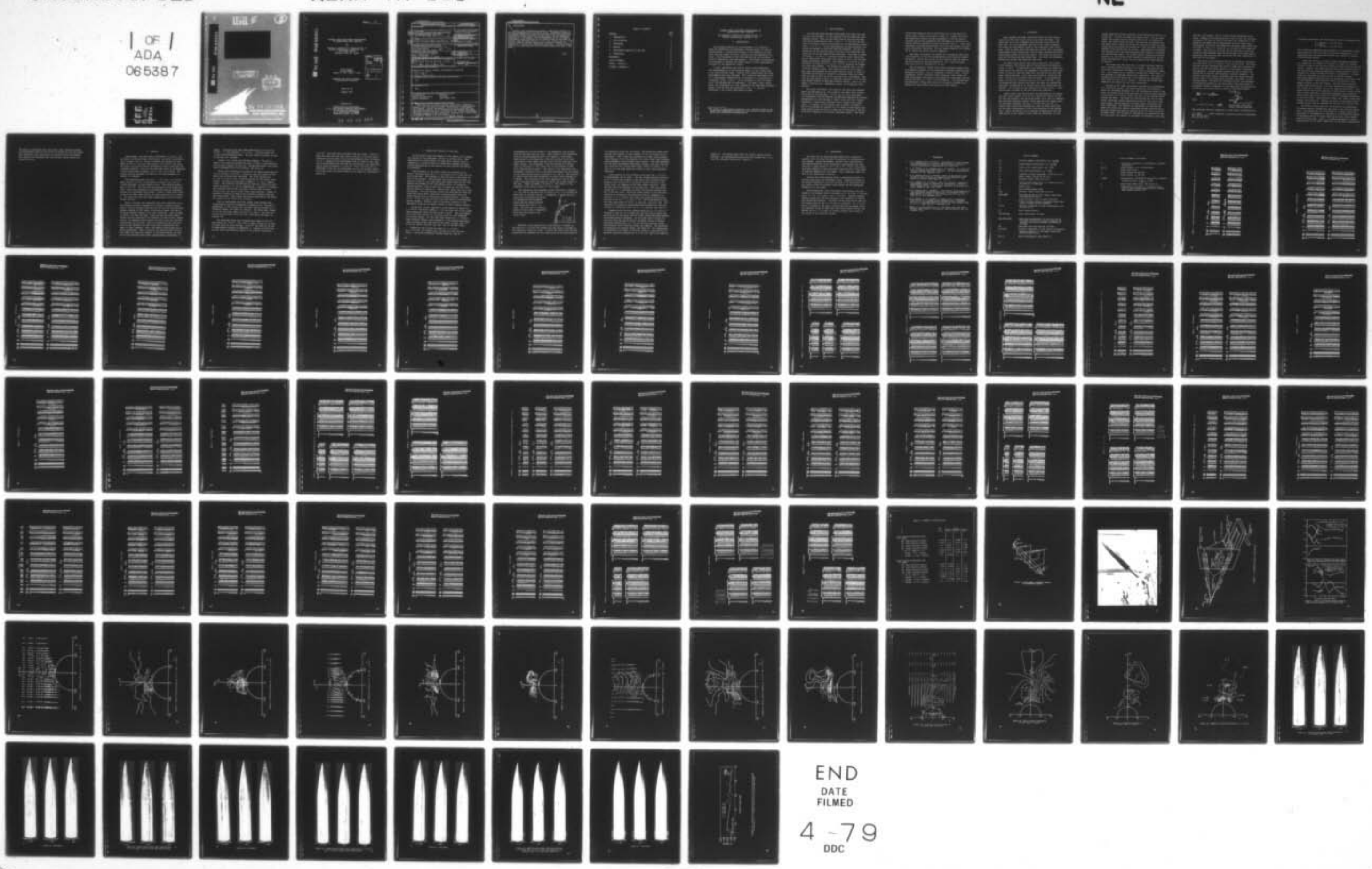

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FURTHER LASER VELOCIMETER MEASUREMENTS OF SLENDER-BODY WAKE VORTICES

by

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Final Report
for the period
March 7, 1977 - May 7, 1978

Approved for public release;
distribution unlimited

NEAR TR 168

August 1978

Prepared for

Aeroballistics Directorate
U. S. Army Missile Research Development,
and Engineering Laboratory
U. S. Army Missile Command
Redstone Arsenal, AL 35809

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (6) FURTHER LASER VELOCIMETER MEASUREMENTS OF SLENDER-BODY WAKE VORTICES.		5. TYPE OF REPORT & PERIOD COVERED Final Technical Report 3/7/77 - 5/7/78
		6. PERFORMING ORG. REPORT NUMBER (14) NEAR-TR-168
7. AUTHOR(s) (10) Richard G. Schwind ~~and~~ Joseph Mullen, Jr		8. CONTRACT OR GRANT NUMBER(s) (15) DAAK40-77-C-0070
9. PERFORMING ORGANIZATION NAME AND ADDRESS Nielsen Engineering & Research, Inc. 510 Clyde Avenue Mountain View, CA 94043 389 783		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Missile Command ATTN: DRSMI-RDK Redstone Arsenal, AL 35809		12. ~~REPORT DATE~~ (11) Aug~~ust 19~~78
		13. NUMBER OF PAGES 87
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) (9) Final technical rept. 7 Mar 77- 7 May 78,		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

(12) 90p.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

N/A

18. SUPPLEMENTARY NOTES

None

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Aerodynamics	Missiles
Bodies of revolution	Vortices
Laser Anemometer	Wind Tunnel Test

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The flow over an ogive-cylinder model with a length-to-diameter ratio of seven has been investigated at incompressible flow speeds. Forces and moments, surface flow visualization, and three-dimensional laser velocimeter measurements have been obtained at pitch angles of 22.5° and 37.5°. Forces and moments have been compared to data previously obtained over a wide range of Reynolds numbers with this model.

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Surface flow visualization shows a complicated pattern of multiple separation and attachment lines. Asymmetric breaks in the primary separation lines are believed to be associated with the tearing loose of attached vortex sheets and the subsequent formation of a new sheet. Three-dimensional laser velocimeter measurements were performed on the leeward side of the model at several cross sections and at X = 2.8, 4.9, and 6.3 for $\alpha = 37\frac{1}{2}°$. deg Vortical regions rapidly become more and more diffusive and asymmetric in nature with downstream distance. Crossflow vector plots do not show distinct vortex centers toward the rear of the model.

alpha

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FURTHER LASER VELOCIMETER MEASUREMENTS OF SLENDER-BODY WAKE VORTICES

by Richard G. Schwind and Joseph Mullen, Jr.
Nielsen Engineering & Research, Inc.

1. INTRODUCTION

The rational modeling of flow phenomena is an effective means for predicting the aerodynamic characteristics of missile configurations. A significant portion of the modeling for moderate and high angles of attack concerns the body separation vortices. The correctness of the flow modeling can only be determined by comparisons with measurements. The present investigation was performed to increase the meager amount of flow measurements available in the separation region.

A laser velocimeter was used to obtain three-dimensional flow measurements in a non-intrusive manner on the leeward side of an ogive-cylinder model. Surface flow visualization and force measurements were also obtained. This study was sponsored by the U. S. Army Missile Command and is an extension of a previous investigation (refs. 1 and 2). As in reference 1, this is a data report for documenting the experiment. The model, laser velocimeter, and instrumentation were supplied by the NASA Ames Research Center,* and the test was performed in the U. S. Army R&T Laboratory 7- by 10-Foot Wind Tunnel at Ames.

*The author is particularly grateful to Dr. Kenneth Orloff of the Large Scale Aerodynamics Branch for the use of his laser velocimeter and associated instrumentation.

2. TEST APPARATUS

An existing ogive-cylinder wind-tunnel test model was used for this test program. It was borrowed from the NASA Ames Aerodynamics Branch. This was the model used in the previous NEAR flow field investigation (refs. 1 and 2). It has been the subject of extensive testing by personnel of the Aerodynamics Branch (refs, 3, 4, 5, 6). In the investigations by Ames personnel the forces and moments on the body have been measured and the surface flow and the vortical flow field have been visualized, the latter by use of the vapor-screen technique. The model is shown in Figure 1. It has a 3.5 length-to-diameter ratio ogive nose with a sharp point (nose apex total angle of 32.9°) and the same length cylindrical afterbody. The diameter is 15.24 cm (6 in.). The model was mounted on a 3.81-cm (1.5-in) diameter six-component task force balance. The balance was mounted into a 5.7-cm (2.25-in) diameter sting. This sting pivoted in pitch about a post that was attached to the tunnel floor as shown in Figure 2. The model centerline was located 4.5 diameters from the tunnel wall in order to make use of an existing laser velocimeter. The test was performed in the U. S. Army R&T Laboratory 7- by 10-Foot Wind Tunnel located at NASA Ames Research Center. This is a low speed, closed-circuit, atmospheric tunnel of rectangular cross section.

The laser velocimeter (LV) used for the flow field measurements was designed by Dr. Ken Orloff of the Large Scale Aerodynamics Branch of NASA Ames. It was lent for this experiment. It incorporates two dual-scatter crossed-beam systems that operate independently at wave-lengths of 488.0 (blue) and 514.5 (green) nanometers. These beams originate from a single 4-watt argon laser. A schematic of the optical path is shown in Figure 3. The two LV systems are mounted at a 30° angle to each other (the green system above the blue) to make the LV sensitive to the two cross-flow components of velocity (described later). The three

fixed-focus lenses of the LV (the center one is the receiving optics) show through the window in Figure 2. Except for use of the fixed-focus lenses and the arrangement of the two sets of transmitting optical components the instrument is similar to an earlier version designed by Grant and Orloff (ref. 7). Also, this instrument contained acousto-optic cells in each channel to eliminate directional ambiguity. The top (green) channel was rotated 90° to obtain the axial velocity component.

The laser velocimeter was placed on a traversing table that could translate in the three perpendicular directions by operating motors. The LV was tilted on this table so that the axis of the blue beams was inclined upwards at 7.74° (thus the green beams were directed downwards at 22.26°).

The LV frequency signals were either analyzed automatically by frequency trackers, or the frequency determined manually using frequency analyzers. This is discussed in detail later. The LV frequencies, three traversing table positions, four normal and side force gages, and tunnel Q were sensed by transducers and the signals delivered to a PDP 11-05 minicomputer. The computer system contained a floppy disk drive for accessible storage and a cathode ray tube display with copier for hard copies.

3. PROCEDURES

Upon assembly the model contained several surface irregularities in the form of bolt holes, pin holes and seams. The seams came at 2/3 of a diameter from the nose (the end of the nose cap), at 3-1/2 diameters (the end of the ogive forebody), and along the longitudinal seams of the clam-shell style afterbody. Most of these holes and seams were filled with a polyester resin-based filler (body putty) and the model smoothed and buffed before being placed in the wind tunnel. Two holes for mounting pins and the nose seam were waxed over. The model was frequently washed with solvent and wiped dry with rags.

Two model pitch angles were used in the test, 22-1/2 and 37-1/2 degrees, the same as used in the previous investigation (refs. 1 and 2). To establish at the higher angle of attack from which side of the missile the asymmetric flow pattern would originate, a strip of tape was added near the nose on the left hand side looking upstream. This tape strip helped to stabilize the flow. It was 0.5 cm wide by 0.026 cm thick. It was placed between 1.75 and 10.3 cm behind the tip (0.11 to 0.68 X/D). The six-component body balance upon which the model was mounted was previously calibrated by an outside group using established procedures. Its calibration was checked in the wind tunnel. Interactions were included in the data reduction equations.

Carbon black flow visualization was performed at two different wind tunnel speeds, 18.2 and 36.4 meters per second (60 and 120 feet per second), and two pitch angles, 22.5 and 37.5 degrees. The resulting Reynolds numbers, based upon the free stream velocity and model diameter, are $Re_D = 0.18 \cdot 10^6$ and $0.37 \cdot 10^6$. A carbon black recipe was developed for each of those conditions for the best visualization of the fine structure of the surface flow. Since the mixture and its method of application may have some effect on the results, these items are described. At the

higher speed the solvent consisted of 60% kerosene and 40% no. 10 weight oil. To this was added 25% carbon black. For the lower speed, the solvent was 87% kerosene and 13% no. 10 weight oil. Again, 25% carbon black was used. The mixture was painted onto the model with a bristle brush and the painting process was continued while the tunnel was started up. This procedure minimized sagging of the mixture due to gravity. Approximately 20 seconds was required after the painting process was stopped to establish the desired flow speed. The surface pattern established itself quickly, but the solvent either gradually evaporated or ran off along the separation lines; and this process took approximately 45 minutes.

The tunnel was then shut down, the nose carefully removed and a carrying handle attached to the model. The model was removed from the balance and taken to a special photographic chamber. This chamber was a framework covered with cheese cloth. It was designed to eliminate destructive highlights. The nose was reinstalled once the model was in the chamber and photographs were taken at every 60° of rotation. The nose was always reassembled to the model with the same orientation.

Setting up the laser velocimeter required the establishment of a coordinate system. The three-dimensional LV traversing table was repeatedly adjusted until the intersection point of the laser velocimeter laser beams followed thin nylon strings attached to plum bobs at the front, middle and rear of the vertical plane through the model. The model was then mounted and the LV wind tunnel coordinate system established using the nose tip at zero pitch angle. The LV position and model angle transducers were then calibrated. The computer was programmed to translate between wind tunnel and missile coordinate systems and vice versa. Position checks were made by aligning the LV on various parts of the model body. The accuracy in determining the position of the LV focus point with respect to the model is believed to have been

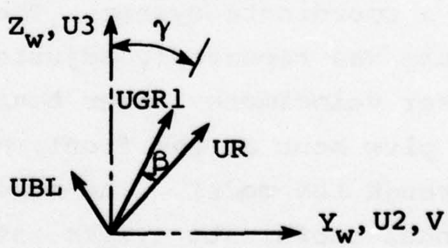
±0.8 mm (.030 inches, .005 D) in each of the coordinate directions. Because of the configuration of the LV with its two sets of beams at 30°, the far side of the model was completely in the shadow of the beams and no measurements could be taken there. Furthermore, the top of the shadow zone extended upward away from the model at about an 8° angle due to the angle of the lower set of beams. The limit on how close the LV focus point could approach the body depended upon the reflections into either photomultiplier tube from any beam reflecting off some combination of the body and the window.

Data points were obtained with the LV system by traversing each horizontal row in a missile cross section twice. The first time the row was traversed both sets of beams were oriented vertically and two cross-flow vectors in wind tunnel coordinates were measured. For the repeat traverse the top LV beams were rotated 90° to measure the horizontal velocity component. The position was nearly always reproduced upon the second traverse within ±.001 D in the horizontal position, and ±.006 D in the vertical plane. The basis for resolving the two non-orthogonal LV velocities measured in the wind tunnel cross flow plane to orthogonal velocity components in the same plane was through the following relationship which is based on the sketch shown:

$$\frac{UGR1}{\cos\beta} = UR = \frac{UBL}{\cos(\beta+30°)}$$

Thus:

$$\beta = \tan^{-1}\left[1.7320 - 2\,\frac{UBL}{UGR1}\right]$$



Wind tunnel cross flow plane, looking upstream

The resulting velocity components in wind tunnel coordinates are:

U1 = UGR2 (axial component, positive direction downstream)
U2 = UR sin (β+γ)
U3 = UR cos (β+γ)

In missile coordinates the dimensionless velocity components are:

$$U = (U1 \cos \alpha - U3 \sin \alpha)/U_\infty$$
$$V = U2/U_\infty$$
$$W = (U1 \sin \alpha + U3 \cos \alpha)/U_\infty$$

While velocity components were measured in a wind-tunnel coordinate system and then resolved into missile coordinates, it is emphasized that the measurement points were located in missile cross-sectional planes.

There were two ways to obtain laser velocimeter readings. The simpler was to command the computer to sample the tracker values 19 times in one-thirtieth second intervals and average the values. However, the signal-to-noise ratio was generally poor in the region of the flow with moderate to large vorticity levels. Tracking the signals became unreliable or impossible. In these cases the frequency was manually read on Hewlett Packard 141T-8443A spectrum analyzers and the resulting values typed into the minicomputer. Each crossflow vector was plotted in its proper location on the CRT display. The data point could be retaken before continuing. This was occasionally necessary if the tracker quit tracking just before sampling took place. In a cross section the lateral position of data points in each row was nearly always the same, simplifying subsequent data reduction. The vertical spacing was chosen to obtain an adequate definition of the flow field. Obtaining data points near vortex centers was usually very difficult. Reading one point in that region could consume as much time as required for the rest of the entire row.

The design concept used for the crossflow two-dimensional LV system created a system that was bulky in the vertical dimension. This particular LV was designed for another tunnel and could only be accommodated at the Army 7- by 10-Foot Wind Tunnel by replacing one of the large tunnel doors with a full length piece of plate glass. Even so, to take measurements in planes perpendicular to the model centerline, as was done, required that

the model be translated along the tunnel axial direction between the measurements taken in the front two planes and the rear plane. Upon completing this translation the balance forces and moments were checked for agreement with the previous values before continuing the test.

4. RESULTS

Model normal- and side-force coefficients, C_N and C_Y, and pitching- and yawing-moment coefficients, C_m and C_n, are presented in Figures 4 and 5. Figure 4 presents the results for the model at 22-1/2° (no tape) and Figure 5, for 37-1/2° with tape. The values are plotted versus the Reynolds number based upon the crossflow velocity. Data for the same body taken in the NASA/Ames 12-Foot Wind Tunnel by Keener, et al. (ref. 6) is shown. The reason for poor agreement in Figure 4, but good agreement in Figure 5 is unknown.

The crossflow vector plot for X = 6.3 (x/L = .9) at the model angle of 22-1/2° is presented in Figure 6 (the view is looking upstream in cross-section plots). The Reynolds number, Re_D is $0.37 \cdot 10^6$. The dots show the positions of the vortex centers. These were obtained by interpolating velocity components between the surrounding data points. Figure 7 shows axial velocities at the same cross section and same conditions as in Figure 6. All velocities have been made dimensionless using the freestream velocity.

Table 1 contains the individual data point positions X,Y,Z, and measured velocity components U,V,W both in missile coordinates. The raw frequency data UB1 and UG1 are the blue and green channel readings in the tunnel cross section plane, and UG2 is the green channel reading in the axial direction. Also included in Table 1 are RMSB and RMSG. These are the root mean square values from the sampling of the trackers for UB1 and UG1, respectively. By comparing these values for these cases the relative unsteadiness can be noted. When the frequencies were read manually on the analyzers the rms values were automatically set equal to these readings. Thus, the manually read values can be easily determined. Table 2 contains the dimensionless circulation (GAM) and vorticity (VORTIC) in the cross section for each set of four adjacent data points (approximately rectangular in

shape). Circulation has been made dimensionless by using the factor: $\pi \times$ body diameter $\times V_\infty \times \sin \alpha$. Positive values are in the counterclockwise sense. The grid center location, XC and YC and area are included.

Tables 1 and 2 have row and point numbers. The row in Table 2 lies half way between the rows in Table 1, and similarly for the point numbers on each row. Values from Table 2 have been used to determine vorticity contours, see Figure 8.

Three cross sections were probed at the model pitch angle of 37-1/2° and $Re_D = 0.23 \cdot 10^6$. A strip of tape was located on the model nose as previously described. The cross sections at X = 2.8, 4.9 and 6.3 (40, 70 and 90 percent of the length) were probed. The data are contained in Tables 3, 5, and 7, respectively. The resulting circulation and vorticity values are presented in Tables 4, 6, and 8, respectively. Figures 9-17 contain the crossflow vector plot, and axial velocity and vorticity contour plots for each of these three cross sections. Figure 18 presents an overlay of some of the vorticity contours from the same three cases. This shows the relative position of the vortical regions in the three cross sections.

Sets of photographs from four carbon black surface flow visualization cases are presented in Figures 19-22. The set of photographs in each figure show the model surface pattern at 6 different angles, 60° apart in rotation. The first case, Figure 19, is for the pitch angle of 22-1/2° (no tape). The flow conditions are the same as for the flow field described above in Figures 6-8.

The remaining three flow visualization cases are for the pitch angle for 37-1/2°. The first of these (Figure 20) is with the tape strip in place and $Re_D = 0.18 \cdot 10^5$, the same as for the LV measurements reported in Reference 1. Figures 21 and 22 are for the cross flow Reynolds number of the present experiment,

$0.37 \cdot 10^5$. The first case is without the tape strip. Figure 22 shows the case with the tape strip in place, so the flow field conditions are the same as for the measurements shown in Figures 9 to 17. Separation and attachment lines as shown in this last set of photographs were read and are indicated on the cross flow vector plots in Figures 9, 12 and 15. Also, the positions as indicated in this set of photographs for the two primary separation lines along the entire length of the model are indicated in Figure 23.

5. PRELIMINARY ANALYSIS OF THE DATA

As previously noted the purpose of this report is to present the results of the experiment, and not to analyze them. Some observations on these results are made here, however, but no comparisons to previous tests or theoretical methods are made. Further manipulation of the results is also possible and should be performed.

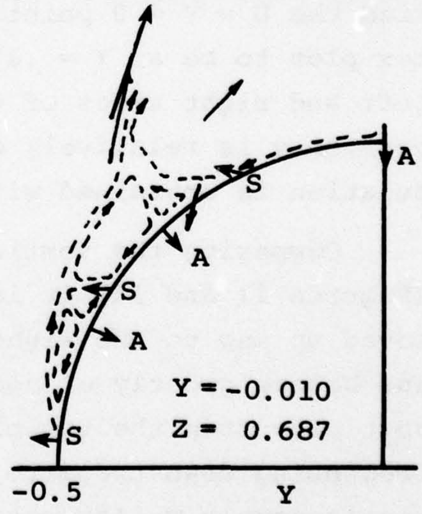
Some blemishes in the carbon black oil surfaces can be noted. The blank spot near $\theta = 0$ in Figure 22 is a spot that did not get painted. This appears to have had only a very local effect on the pattern. The uniformly dark areas, particularly in Figures 19 and 20, are areas where the carbon black did not flow. Smudges and scrapes of the flow pattern after its formation - during handling - show on the nose in Figure 21, and just above the mid section of Figure 22. These do not affect the use of the photographs. The flow patterns across the longitudinal seams and large bolt holes (both filled with polyester-based resin and sanded smooth) show no indication of discontinuities. The seam at $X = .50$ and the body pin hole does show signs of discontinuous surface heights. However, none of the major features in the separation lines can be readily traced to these junction effects.

The primary (first) separation lines showing in Figure 19, $\alpha = 22\text{-}1/2°$, are quite symmetric. For the first 55% of the length these separation lines are very close to $\pm 100°$. Then the separation lines move further aft to nearly $\pm 120°$ for the remainder of the body length. For the next case (Figure 20, $\alpha = 37\text{-}1/2°$, lower Reynolds number) large asymmetry in the primary separation lines is noted on the rear half of the model, greater than $+90°$ in the 60° photo, and much less than $-90°$ in the 240° photo.

Figures 21 and 22 show the model at $\alpha = 37\text{-}1/2°$, $Re_D = 0.37 \cdot 10^6$, and respectively, without and with the tape strip. A striking difference between these two sets of

photographs are the two breaks in the separation line on each side for the case with the tape. These breaks in the separation lines are placed asymmetrically with respect to each other. These breaks in the separation lines are believed to be associated with vortex sheets tearing loose from the body and a new sheet forming. The attachment lines were marked with dashed lines on the model in this latter set of photographs to make their identification easier. The angles of the separation and attachment lines were read on enlarged photographs and are marked on the cross vector plots in Figures 9, 12, and 15. The location of these points has been determined to within three quarters of a degree. The locations of the first separation line on each side of the model has been read for nearly the entire length of the body. These are shown in Figure 23. The breaks in the separation lines show in detail in this figure.

The separation and attachment points indicated in Figure 9 (X = 2.8) and on the left side of Figure 12 (X = 4.9) contain an extra pair of singular points. A schematic is shown here of a local flow field which satisfies all separation and attachment points and the nearby measured flow vectors for the X = 4.9 case. The extra set of singular points in this case is associated with the first break in the vortex sheet.



Returning to the surface flow visualization in Figure 21, the case at $\alpha = 37\text{-}1/2°$ but without the tape strip, no breaks in the separation lines are noted. Possibly the severe flow unsteadiness that was observed for this case is due to an oscillation of

the separation lines for the breaks. The resulting carbon black surface flow pattern of some average for the flow would not be meaningful. Also, since one placement of a tape strip produced large changes in the flow pattern, one could reason that possibly other placements would produce other results. The good agreement for the force and moment coefficients between this test with the tape strip and the 12-Foot Wind Tunnel results of Keener, et al (ref. 6) for the same model but without a tape strip indicates otherwise.

Some analysis of the crossflow plots from the $\alpha = 37\text{-}1/2°$ LV measurements are in order. The two counter-rotating vortices at $X = 2.8$ that are evident in the vector and vorticity plots, Figures 9 and 11, have 15 to 25 percent excess velocity in the vortex cores (as compared to the free-stream velocity). These vortices have the character of swirling jets. The circulation inside the $\Omega = \pm.5$ contours and above the bottom traverse line are -0.169 and +.306. While the vortex center on the left side could not be located by interpolating velocity components to find the $U = V = 0$ point, the center was selected from the vortex plot to be at $Y = .17$ and $Z = .61$. The circulations on the left and right sides of the $\Omega = 0$ line are -.151 and +.291. The vorticity is relatively concentrated and virtually all the circulation is contained within the $\Omega = \pm.5$ contours (see Table 9).

Comparing the vorticity contour plots for $X = 2.8$ and 4.9 (Figures 11 and 14) it is noted that the left vortex center has moved up and to the right, and the right vortex has moved upwards and become greatly elongated. In the lower left of Figure 14 vorticity from the top of another clockwise vortex is evident. Continuing downstream to $X = 6.3$ the vortical regions enlarge significantly while vorticity levels are reduced. The resulting circulations are actually larger (see Table 9). For convenience in visualizing the growth of vortical regions a superposition of selected vorticity contours for $X = 2.8$, 4.9, and 6.3 is shown in

Figure 18. The shaded areas show the central regions of the vortices. No concentrated vortex cores are evident at X = 6.3 from the crossflow vector plot, Figure 15.

6. CONCLUSIONS

The flow over an ogive-cylinder model with a length-to-diameter ratio of seven has been investigated at incompressible flow speeds. Forces and moments, surface flow visualization, and three-dimensional laser velocimeter measurements have been obtained at pitch angles of 22.5° and 37.5°. Forces and moments have been compared to data previously obtained over a wide range of Reynolds numbers with this model. This comparison shows the flow to be transitional in nature.

Surface flow visualization shows a complicated pattern of multiple separation and attachment lines. Asymmetric breaks in the primary separation lines are believed to be associated with the tearing loose of attached vortex sheets and the subsequent formation of a new sheet.

Three-dimensional laser velocimeter measurements were performed on the leeward side of the model at $X = 6.3$ for $\alpha = 22\text{-}1/2°$, and at $X = 2.8$, 4.9, and 6.3 for $\alpha = 37\text{-}1/2°$. Vortical regions rapidly become more and more diffusive and asymmetric in nature with downstream distance. Crossflow vector plots do not show all the vortex cores at the $X = 4.9$ and 6.3 locations. At $X = 2.8$, which is located on the nose, the vortices have a greater velocity component along the body axis than free-stream velocity, but farther aft at $X = 4.9$ and 6.3 velocity defects are evident in the center of the vortical regions.

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LIST OF SYMBOLS

C_m	Pitching moment coefficient, $C_m = M_m/SQD$
C_n	Yawing moment coefficient, $C_n = M_n/SQD$
C_N	Normal force coefficient, $C_N = N/SQ$
C_Y	Side force coefficient, $C_Y = Y/SQ$
D	Diameter of model afterbody, 15.24 cm (6 in.)
L	Model length, 106.68 cm (42 in.)
M_m	Pitching moment about x/L = 0.5
M_n	Yawing moment about x/L = 0.5, positive force on nose in +Y direction
N	Normal force
Q	Free stream dynamic head
Re_D	Reynolds number based upon U_∞ and D
RMSB,RMSG	Root mean square of blue, green, beam laser velocimeter raw data
S	Cross sectional area of model afterbody
s	Distance along a path in the model cross flow plane, divided by body diameter
U,V,W	Velocity components in body coordinates X,Y,Z divided by U_∞
U_∞	Free stream velocity
UB1,UG1,UG2	Laser velocimeter raw data
UBL,UGR1,UGR2	Velocities perpendicular to the axis and in the plane of the blue, green (oriented vertically), and green (rotated horizontally) LV beams
UR	Resultant velocity from UBL and UGR1
U1,U2,U3	Velocity components in wind tunnel coordinates
v	resultant velocity in the model cross flow plane divided by U_∞
X,Y,Z	Body coordinates/D (see Figure 1)

LIST OF SYMBOLS (concluded)

Y	Side force (positive in Y-direction), lateral coordinate
YC,ZC	Vortex center in Y, Z coordinates
α	Model pitch angle
β	Angle between UR and UGR
γ	Angle between Z_w and UGR
Γ,GAM	Dimensionless circulation, positive in counter-clockwise sense, $\frac{1}{\pi \sin \alpha} \int \bar{v} \cdot \overline{ds}$
θ	Angle about model axis, see Figure 23
Ω	Dimensionless vorticity, Γ divided by the area of the enclosed quadrilateral (lengths made dimensionless by D)

Table 1. Flow Field Velocities at 22.5° Pitch Angle and X = 6.3

NPT	RUN	IY	JZ	LUDIR		UT	P
26	017	8	1	1	2	36.540	16.846

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	017	1	6.297	-1.000	0.367	0.949	-0.010	0.495	138.3	128.8	754.1	138.4	129.0
2	017	2	6.298	-0.980	0.364	0.934	-0.010	0.502	156.7	147.3	760.1	157.0	147.4
3	017	3	6.298	-0.840	0.369	0.942	0.015	0.526	168.3	178.2	762.1	168.5	178.3
4	017	4	6.301	-0.700	0.356	0.947	0.022	0.552	194.2	209.2	762.1	194.8	209.5
5	017	5	6.300	-0.631	0.358	0.932	0.056	0.570	206.6	247.9	762.1	208.0	248.2
6	017	6	6.303	-0.560	0.355	0.947	0.063	0.556	176.5	222.7	768.1	177.0	223.1
7	017	7	6.299	-0.489	0.359	0.941	0.141	0.571	152.1	257.0	758.1	152.7	257.4
8	017	8	6.302	-0.420	0.356	0.935	0.293	0.545	35.7	259.4	760.1	35.7	259.4

NPT	RUN	IY	JZ	LUDIR		UT	P
52	017	12	2	1	2	0.67882	0.58312E-02

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
27	017	1	6.303	-1.001	0.439	0.945	-0.002	0.505	148.7	145.5	752.1	148.8	145.6
28	017	2	6.302	-0.981	0.440	0.952	0.012	0.500	129.6	137.5	752.1	129.6	137.6
29	017	3	6.302	-0.840	0.439	0.933	0.005	0.525	176.7	179.2	752.1	177.0	179.3
30	017	4	6.301	-0.700	0.441	0.936	0.028	0.541	182.0	201.8	752.1	182.3	202.0
31	017	5	6.302	-0.631	0.439	0.928	0.044	0.539	175.8	208.2	754.1	176.1	208.5
32	017	6	6.301	-0.560	0.441	0.933	0.084	0.544	156.1	218.8	754.1	156.4	219.1
33	017	7	6.303	-0.490	0.438	0.932	0.069	0.543	163.9	215.2	754.1	164.9	215.7
34	017	8	6.304	-0.420	0.434	0.935	0.119	0.535	123.5	213.3	758.1	123.5	213.3
35	017	9	6.301	-0.350	0.439	0.896	0.334	0.462	-74.0	181.3	710.0	-74.0	181.3
36	017	10	6.303	-0.314	0.438	0.815	0.960	0.475	-369.3	359.5	662.0	-369.3	359.5
37	017	11	6.303	-0.279	0.439	0.900	0.076	0.044	-473.0	-413.6	601.9	-473.0	-413.6
38	017	12	6.303	-0.243	0.438	0.893	-0.075	0.024	-407.2	-463.7	589.8	-407.2	-463.7

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Table 1. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
26	014	16	4	1	2	36.588	16.940

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	014	1	6.300	-1.000	0.519	0.948	0.021	0.465	81.1	95.8	740.1	82.3	96.7
2	014	2	6.304	-0.982	0.515	0.938	0.027	0.496	124.0	143.1	744.1	124.6	143.4
3	014	3	6.303	-0.840	0.518	0.952	0.007	0.480	105.6	109.6	744.1	105.9	110.1
4	014	4	6.300	-0.699	0.522	0.934	0.086	0.526	129.5	193.3	744.1	129.5	193.3
5	014	5	6.301	-0.630	0.516	0.928	0.068	0.537	157.4	207.3	744.1	157.4	207.3
6	014	6	6.302	-0.560	0.519	0.924	0.125	0.534	123.5	217.3	742.1	123.5	217.3
7	014	7	6.301	-0.490	0.517	0.927	0.128	0.535	121.5	217.3	744.1	121.5	217.3
8	014	8	6.301	-0.420	0.523	0.932	0.086	0.528	133.5	197.3	744.1	133.5	197.3
9	014	9	6.300	-0.350	0.517	0.939	0.116	0.521	103.5	189.3	742.1	103.5	189.3
10	014	10	6.298	-0.281	0.529	0.911	0.152	0.184	-337.4	-221.3	639.9	-337.4	-221.3
11	014	11	6.299	-0.210	0.524	1.017	-0.080	0.097	-375.3	-435.6	690.0	-375.3	-435.6
12	014	12	6.305	-0.142	0.512	1.005	-0.071	-0.008	-508.9	-561.8	651.9	-508.9	-561.8
13	014	13	6.297	-0.071	0.530	1.004	0.083	-0.045	-636.6	-571.8	631.9	-636.6	-571.8
14	014	14	6.302	-0.003	0.518	0.989	0.236	-0.020	-680.5	-501.7	625.9	-680.5	-501.7
15	014	15	6.303	0.066	0.519	0.989	0.179	-0.023	-656.6	-519.7	629.9	-656.6	-519.7
16	014	16	6.298	0.136	0.523	0.978	0.322	0.012	-682.5	-439.6	627.9	-682.5	-439.6

NPT	RUN	IY	JZ	LUDIR		UT	P
26	015	20	5	1	2	6.5149	0.54230

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	015	1	6.298	-1.000	0.565	0.949	0.028	0.487	103.9	124.1	744.1	104.3	124.8
2	015	2	6.298	-0.980	0.562	0.945	0.023	0.493	117.9	133.7	744.1	118.3	133.9
3	015	3	6.297	-0.840	0.565	0.957	0.042	0.499	107.3	137.1	744.1	107.9	137.3
4	015	4	6.300	-0.701	0.561	0.949	0.063	0.511	114.2	159.9	742.1	114.5	160.1
5	015	5	6.299	-0.631	0.561	0.949	0.076	0.503	97.7	153.2	742.1	98.2	153.6
6	015	6	6.303	-0.561	0.553	0.940	0.110	0.520	104.3	186.0	742.1	105.7	186.4
7	015	7	6.298	-0.489	0.563	0.949	0.078	0.507	100.0	158.1	742.1	41.6	158.5
8	015	8	6.304	-0.420	0.555	0.937	0.120	0.518	98.1	187.2	742.1	98.6	187.3
9	015	9	6.299	-0.349	0.564	0.937	0.105	0.522	111.5	189.3	742.1	111.5	189.3
10	015	10	6.298	-0.279	0.562	0.929	0.157	0.291	-209.7	-91.1	674.0	-209.7	-91.1
11	015	11	6.300	-0.210	0.560	1.026	0.017	0.171	-337.4	-323.5	708.0	-337.4	-323.5
12	015	12	6.303	-0.139	0.554	0.988	-0.100	0.070	-377.3	-451.7	651.9	-377.3	-451.7
13	015	13	6.299	-0.070	0.565	0.992	-0.137	-0.088	-560.8	-662.0	613.9	-560.8	-662.0
14	015	14	6.297	-0.002	0.561	0.995	-0.196	-0.139	-592.7	-738.1	599.9	-592.7	-738.1
15	015	15	6.300	0.070	0.563	0.980	0.163	-0.101	-748.4	-621.9	607.9	-748.4	-621.9
16	015	16	6.301	0.140	0.560	0.976	0.238	-0.058	-732.4	-549.8	615.9	-732.4	-549.8
17	015	17	6.303	0.209	0.560	0.957	0.146	0.087	-481.0	-369.5	639.9	-481.0	-369.5
18	015	18	6.302	0.280	0.561	0.994	0.134	0.166	-391.2	-289.4	684.0	-391.2	-289.4
19	015	19	6.301	0.349	0.558	0.889	-0.122	0.294	-26.1	-119.2	651.9	-26.1	-119.2
20	015	20	6.294	0.421	0.578	0.936	-0.152	0.443	157.4	41.1	722.0	157.4	41.1

Table 1. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
104	016	20	6	1	2	3.4111	0.14870

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
79	016	1	6.299	-1.000	0.602	0.949	0.018	0.482	104.3	116.8	744.1	104.3	116.9
80	016	2	6.298	-0.981	0.603	0.950	0.024	0.476	92.9	110.1	744.1	93.2	110.4
81	016	3	6.300	-0.840	0.600	0.944	0.043	0.496	110.8	141.9	744.1	110.9	142.2
82	016	4	6.301	-0.699	0.596	0.941	0.067	0.493	94.9	144.5	744.1	95.2	144.7
83	016	5	6.305	-0.630	0.592	0.941	0.070	0.506	109.2	161.2	744.1	109.4	161.4
84	016	6	6.299	-0.560	0.600	0.943	0.087	0.508	101.0	165.6	744.1	102.2	165.9
85	016	7	6.299	-0.490	0.604	0.942	0.096	0.508	96.5	167.9	744.1	96.7	168.2
86	016	8	6.299	-0.420	0.604	0.938	0.095	0.516	109.4	180.1	744.1	109.6	180.3
87	016	9	6.300	-0.349	0.602	0.938	0.093	0.513	107.5	176.5	744.1	107.5	176.5
88	016	10	6.296	-0.280	0.605	0.914	0.211	0.437	-46.1	113.2	708.0	-46.1	113.2
89	016	11	6.300	-0.211	0.597	0.980	0.082	0.253	-243.6	-181.3	700.0	-243.6	-181.3
90	016	12	6.304	-0.139	0.591	0.979	0.250	0.135	-489.0	-299.4	666.0	-489.0	-299.4
91	016	13	6.298	-0.070	0.604	0.987	0.138	-0.110	-744.4	-637.9	605.9	-744.4	-637.9
92	016	14	6.299	0.001	0.602	0.983	0.112	-0.189	-834.1	-746.1	585.8	-834.1	-746.1
93	016	15	6.299	0.069	0.601	0.972	0.211	-0.163	-854.1	-690.0	587.8	-854.1	-690.0
94	016	16	6.301	0.140	0.602	0.964	0.261	-0.087	-776.3	-575.8	599.9	-776.3	-575.8
95	016	17	6.298	0.210	0.603	0.967	0.087	0.088	-453.1	-385.6	649.9	-453.1	-385.6
96	016	18	6.303	0.281	0.594	0.967	0.071	0.219	-275.5	-221.3	686.0	-275.5	-221.3
97	016	19	6.301	0.348	0.601	0.911	-0.163	0.344	49.7	-75.1	682.0	49.7	-75.1
98	016	20	6.300	0.421	0.602	0.955	-0.127	0.456	151.4	53.1	744.1	151.4	53.1

NPT	RUN	IY	JZ	LVDIR		UT	P
78	016	24	7	1	2	35.865	16.438

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
53	016	1	6.298	-1.000	0.644	0.953	0.027	0.481	95.6	114.5	744.1	95.8	114.6
54	016	2	6.301	-0.980	0.635	0.941	0.024	0.477	99.8	116.7	742.1	100.1	117.1
55	016	3	6.299	-0.840	0.644	0.957	-0.007	0.452	75.7	69.0	742.1	76.2	86.7
56	016	4	6.300	-0.699	0.642	0.942	0.055	0.484	90.3	131.3	746.1	90.8	132.0
57	016	5	6.302	-0.631	0.636	0.940	0.068	0.487	87.9	138.6	746.1	88.9	138.8
58	016	6	6.300	-0.560	0.640	0.941	0.097	0.489	72.5	145.1	744.1	72.8	145.4
59	016	7	6.299	-0.490	0.640	0.939	0.100	0.501	87.6	162.0	744.1	88.7	162.2
60	016	8	6.304	-0.420	0.635	0.943	0.133	0.497	60.5	160.7	746.1	62.0	161.4
61	016	9	6.299	-0.351	0.644	0.946	0.145	0.518	79.4	187.3	748.1	80.1	187.9
62	016	10	6.302	-0.280	0.641	0.921	0.150	0.500	67.6	181.3	736.1	67.6	181.3
63	016	11	6.301	-0.211	0.643	0.958	0.124	0.291	-207.7	-113.2	700.0	-207.7	-113.2
64	016	12	6.304	-0.140	0.636	1.001	0.159	0.152	-431.1	-309.4	690.0	-431.1	-309.4
65	016	13	6.298	-0.070	0.642	0.978	0.133	-0.098	-732.4	-627.9	611.9	-732.4	-627.9
66	016	14	6.300	0.001	0.645	0.963	0.175	-0.191	-862.1	-726.0	571.8	-862.1	-726.0
67	016	15	6.299	0.069	0.644	0.970	0.148	-0.218	-888.0	-772.1	571.8	-888.0	-772.1
68	016	16	6.301	0.139	0.639	0.958	0.061	-0.137	-722.4	-674.0	581.8	-722.4	-674.0
69	016	17	6.301	0.210	0.641	0.931	-0.006	0.120	-341.4	-345.5	639.9	-341.4	-345.5
70	016	18	6.3[illegible]	0.278	0.642	0.960	-0.039	0.249	-169.8	-199.3	688.0	-169.8	-199.3
71	016	19	6.304	0.351	0.637	0.913	-0.204	0.395	143.4	-13.0	700.0	143.4	-13.0
72	016	20	6.302	0.421	0.636	0.966	-0.178	0.454	171.4	35.1	748.1	171.4	35.1
73	016	21	6.303	0.489	0.636	0.961	-0.147	0.444	145.6	31.0	750.1	145.6	31.0
74	016	22	6.305	0.559	0.635	0.974	-0.151	0.446	141.1	25.0	750.1	141.1	25.0
75	016	23	6.303	0.630	0.636	0.961	-0.075	0.450	109.7	51.1	746.1	109.7	51.1
76	016	24	6.301	0.702	0.636	0.967	-0.123	0.457	144.3	49.1	750.1	144.3	49.1

Table 1. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
26	013	26	8	1	2	36.402	16.768

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	013	1	6.295	-0.999	0.684	0.931	0.029	0.451	68.3	89.7	738.1	68.5	90.5
2	013	2	6.297	-0.980	0.684	0.940	-0.008	0.460	95.8	88.7	738.1	96.0	97.4
3	013	3	6.300	-0.840	0.676	0.939	0.048	0.478	87.1	122.1	738.1	87.6	122.9
4	013	4	6.300	-0.699	0.672	0.941	0.108	0.491	68.8	150.5	746.1	69.3	158.0
5	013	5	6.301	-0.630	0.675	0.943	0.024	0.466	85.0	101.9	746.1	85.5	122.1
6	013	6	6.298	-0.561	0.680	0.932	0.154	0.513	75.7	192.5	746.1	76.2	253.2
7	013	7	6.297	-0.490	0.682	0.950	0.110	0.485	55.7	138.2	748.1	56.4	201.9
8	013	8	6.297	-0.420	0.680	0.949	0.092	0.491	73.9	142.3	748.1	75.1	230.8
9	013	9	6.298	-0.350	0.680	0.944	0.099	0.498	81.3	155.8	748.1	82.6	172.1
10	013	10	6.300	-0.279	0.672	0.913	0.287	0.519	17.8	235.3	734.1	17.8	235.3
11	013	11	6.297	-0.210	0.685	0.967	0.176	0.302	-229.6	-95.1	712.0	-229.6	-95.1
12	013	12	6.299	-0.141	0.680	1.002	0.210	0.136	-483.0	-321.5	690.0	-483.0	-321.5
13	013	13	6.299	-0.071	0.678	1.006	0.220	-0.069	-756.3	-585.8	635.9	-756.3	-585.8
14	013	14	6.301	0.000	0.673	0.970	0.176	-0.214	-902.0	-764.1	573.8	-902.0	-764.1
15	013	15	6.297	0.069	0.683	0.961	0.129	-0.226	-884.0	-782.1	563.8	-884.0	-782.1
16	013	16	6.298	0.140	0.680	0.923	0.045	-0.135	-698.5	-662.0	565.8	-698.5	-662.0
17	013	17	6.299	0.211	0.676	0.988	-0.109	0.118	-315.4	-397.6	674.0	-315.4	-397.6
18	013	18	6.295	0.280	0.693	0.963	-0.090	0.294	-86.0	-155.2	712.0	-86.0	-155.2
19	013	19	6.296	0.350	0.686	0.976	-0.212	0.434	159.4	-3.0	748.1	159.4	-3.0
20	013	20	6.297	0.420	0.686	0.972	-0.183	0.445	159.4	19.0	748.1	159.4	19.0
21	013	21	6.299	0.490	0.681	0.970	-0.171	0.436	143.4	11.0	754.1	143.4	11.0
22	013	22	6.296	0.560	0.684	0.963	-0.142	0.447	141.5	31.0	756.1	141.5	31.0
23	013	23	6.299	0.631	0.685	0.975	-0.143	0.450	141.5	31.0	756.1	141.5	31.0
24	013	24	6.301	0.700	0.673	0.973	-0.143	0.449	141.5	31.0	756.1	141.5	31.0
25	013	25	6.303	0.841	0.672	0.977	-0.110	0.466	141.5	57.1	756.1	141.5	57.1
26	013	26	6.299	0.982	0.684	0.970	-0.088	0.460	125.5	57.1	756.1	125.5	57.1

Table 1. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
78	012	26	9	1	2	35.964	16.558

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
53	012	1	6.297	-1.001	0.765	0.952	0.027	0.460	69.2	88.7	738.1	69.5	89.0
54	012	2	6.299	-0.980	0.762	0.952	0.038	0.467	71.1	98.9	738.1	71.4	99.1
55	012	3	6.297	-0.841	0.766	0.945	0.055	0.464	61.3	101.9	732.1	63.2	102.2
56	012	4	6.302	-0.700	0.756	0.943	0.069	0.472	64.8	116.0	732.1	65.6	116.4
57	012	5	6.300	-0.630	0.757	0.943	0.087	0.468	48.8	113.7	732.1	50.5	113.8
58	012	6	6.303	-0.559	0.754	0.938	0.089	0.467	49.3	115.7	732.1	49.9	116.0
59	012	7	6.304	-0.490	0.753	0.940	0.106	0.464	36.4	116.3	738.1	38.2	116.7
60	012	8	6.301	-0.420	0.759	0.947	0.126	0.467	23.5	118.4	738.1	24.7	118.6
61	012	9	6.305	-0.350	0.754	0.933	0.169	0.477	19.8	148.0	736.1	23.5	149.0
62	012	10	6.297	-0.280	0.767	0.947	0.195	0.466	-16.4	129.6	734.1	18.8	130.3
63	012	11	6.299	-0.210	0.762	0.920	0.406	0.431	-167.8	139.2	710.0	-167.8	139.2
64	012	12	6.303	-0.140	0.755	0.931	0.428	0.235	-437.1	-113.2	662.0	-437.1	-113.2
65	012	13	6.302	-0.071	0.754	0.925	0.360	0.042	-646.6	-371.5	609.9	-646.6	-371.5
66	012	14	6.298	-0.000	0.764	0.926	0.410	-0.104	-858.1	-545.8	567.8	-858.1	-545.8
67	012	15	6.300	0.069	0.762	0.971	0.160	-0.159	-816.2	-692.0	585.8	-816.2	-692.0
68	012	16	6.299	0.139	0.763	0.970	-0.106	-0.051	-522.9	-601.9	613.9	-522.9	-601.9
69	012	17	6.299	0.210	0.763	0.970	-0.191	0.133	-237.6	-381.5	662.0	-237.6	-381.5
70	012	18	6.299	0.280	0.762	0.951	-0.209	0.321	25.7	-133.2	700.0	25.7	-133.2
71	012	19	6.299	0.350	0.763	0.976	-0.156	0.426	115.5	-3.0	738.1	115.5	-3.0
72	012	20	6.299	0.420	0.764	0.970	-0.113	0.427	95.4	10.0	736.1	95.5	532.4
73	012	21	6.303	0.490	0.757	0.960	-0.112	0.435	111.6	25.3	738.1	111.9	134.7
74	012	22	6.299	0.560	0.762	0.975	-0.175	0.409	105.9	-27.3	738.1	106.0	573.7
75	012	23	6.300	0.630	0.763	0.370	-0.104	0.435	101.4	21.9	738.1	101.5	114.5
76	012	24	6.299	0.700	0.761	0.974	-0.119	0.424	92.7	2.0	738.1	92.8	7.4
77	012	25	6.297	0.841	0.766	0.957	-0.113	0.434	113.5	26.3	738.1	188.9	27.2
78	012	26	6.299	0.980	0.763	0.963	-0.156	0.448	151.1	32.5	738.1	214.5	33.4

Table 1. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
52	012	26	10	1	2	35.591	16.217

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
27	012	1	6.296	-1.000	0.846	0.935	0.042	0.447	53.1	83.7	722.0	54.4	84.0
28	012	2	6.295	-0.980	0.846	0.940	0.036	0.457	66.4	92.7	728.0	66.9	93.1
29	012	3	6.297	-0.840	0.843	0.940	0.052	0.454	53.2	91.3	732.1	53.9	91.5
30	012	4	6.294	-0.700	0.846	0.928	0.081	0.449	37.3	97.6	724.0	38.0	97.9
31	012	5	6.297	-0.630	0.847	0.939	0.093	0.459	36.8	106.4	732.1	37.8	107.0
32	012	6	6.296	-0.559	0.846	0.942	0.106	0.450	16.8	95.8	728.0	18.2	96.6
33	012	7	6.297	-0.490	0.848	0.929	0.111	0.448	18.2	101.5	722.0	19.8	101.8
34	012	8	6.299	-0.420	0.839	0.936	0.134	0.447	-0.9	100.5	728.0	7.1	100.6
35	012	9	6.299	-0.350	0.841	0.933	0.164	0.440	-24.4	99.4	724.0	27.0	99.7
36	012	10	6.300	-0.281	0.836	0.937	0.205	0.426	-68.2	86.9	720.0	68.9	87.7
37	012	11	6.302	-0.210	0.834	0.934	0.304	0.391	-168.8	61.3	708.0	169.2	63.2
38	012	12	6.299	-0.140	0.842	0.932	0.186	0.215	-327.4	-185.3	662.0	-327.4	-185.3
39	012	13	6.302	-0.070	0.838	0.909	0.185	0.021	-560.8	-419.6	589.8	-560.8	-419.6
40	012	14	6.301	0.000	0.837	0.967	0.137	-0.141	-774.3	-668.0	585.8	-774.3	-668.0
41	012	15	6.299	0.070	0.844	0.950	0.059	-0.102	-670.6	-623.9	585.8	-670.6	-623.9
42	012	16	6.301	0.140	0.837	0.933	-0.145	-0.017	-439.1	-547.8	599.9	-439.1	-547.8
43	012	17	6.306	0.210	0.828	0.962	-0.180	0.195	-159.8	-295.4	672.0	-159.8	-295.4
44	012	18	6.302	0.279	0.836	0.978	-0.241	0.329	39.7	-143.2	718.0	39.7	-143.2
45	012	19	6.302	0.350	0.837	0.975	-0.167	0.385	70.1	-56.3	728.0	70.2	57.3
46	012	20	6.303	0.420	0.836	0.970	-0.163	0.406	97.4	-26.3	730.1	126.1	28.6
47	012	21	6.302	0.491	0.838	0.969	-0.134	0.409	85.7	-16.3	730.1	86.1	19.8
48	012	22	6.302	0.560	0.838	0.960	-0.129	0.411	90.7	-8.0	730.1	91.6	20.4
49	012	23	6.302	0.630	0.839	0.972	-0.118	0.401	64.9	-24.7	730.1	65.1	26.2
50	012	24	6.305	0.701	0.828	0.973	-0.122	0.415	83.9	-8.9	732.1	84.0	13.3
51	012	25	6.298	0.840	0.843	0.984	-0.108	0.428	87.0	6.8	732.1	239.0	10.2
52	012	26	6.299	0.980	0.843	0.964	-0.097	0.427	90.2	16.3	732.1	90.3	17.4

Table 1. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
26	012	26	11	1	2	36.046	16.633

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	012	1	6.311	-1.000	0.920	0.940	0.046	0.449	50.2	83.8	724.0	50.6	84.2
2	012	2	6.307	-0.981	0.921	0.933	0.042	0.454	62.9	93.4	724.0	63.0	93.8
3	012	3	6.311	-0.840	0.916	0.940	0.055	0.446	40.8	80.7	720.0	41.4	81.1
4	012	4	6.307	-0.701	0.922	0.942	0.075	0.459	45.7	101.0	731.1	46.1	101.4
5	012	5	6.310	-0.630	0.921	0.950	0.091	0.453	24.3	91.6	731.6	24.9	91.8
6	012	6	6.306	-0.560	0.923	0.978	0.100	0.456	8.1	83.1	752.9	10.9	83.4
7	012	7	6.308	-0.489	0.920	0.925	0.078	0.430	16.0	74.9	713.1	1044.2	75.7
8	012	8	6.308	-0.420	0.920	0.927	0.138	0.416	-37.7	66.2	713.6	38.0	67.0
9	012	9	6.311	-0.349	0.914	0.929	0.166	0.413	-57.8	66.8	709.2	59.8	67.3
10	012	10	6.303	-0.279	0.932	0.944	0.151	0.398	-78.0	36.8	716.0	1087.1	37.7
11	012	11	6.304	-0.209	0.932	0.929	0.152	0.365	-113.4	1.7	700.0	115.3	10.5
12	012	12	6.305	-0.140	0.927	0.925	0.240	0.306	-234.5	-53.7	676.0	234.5	54.6
13	012	13	6.307	-0.070	0.926	0.944	0.109	0.089	-449.1	-365.5	629.9	-449.1	-365.5
14	012	14	6.310	0.000	0.921	0.968	0.085	-0.054	-636.6	-569.8	611.9	-636.6	-569.8
15	012	15	6.310	0.070	0.923	0.943	-0.191	-0.025	-425.1	-567.7	599.9	425.1	568.2
16	012	16	6.310	0.139	0.920	0.927	-0.183	0.141	-206.3	-343.1	629.9	206.3	343.1
17	012	17	6.309	0.211	0.922	0.969	-0.190	0.270	-59.9	-202.9	692.0	60.0	203.2
18	012	18	6.308	0.279	0.920	0.959	-0.142	0.332	-3.3	-111.6	710.0	4.9	112.4
19	012	19	6.308	0.350	0.926	0.960	-0.142	0.357	28.1	-79.8	714.0	31.3	81.8
20	012	20	6.310	0.421	0.920	0.955	-0.119	0.386	59.5	-31.1	716.0	59.8	32.5
21	012	21	6.310	0.491	0.921	0.946	-0.118	0.388	62.5	-28.3	716.0	63.1	29.9
22	012	22	6.310	0.560	0.922	0.952	-0.107	0.393	58.8	-22.8	716.0	59.0	24.6
23	012	23	6.310	0.631	0.919	0.945	-0.112	0.403	78.7	-7.2	720.0	79.0	12.1
24	012	24	6.310	0.700	0.922	0.950	-0.100	0.404	69.3	-7.1	720.0	69.5	15.5
25	012	25	6.310	0.839	0.922	0.945	-0.078	0.405	62.4	2.1	720.0	62.7	6.8
26	012	26	6.311	0.980	0.922	0.954	-0.070	0.418	69.3	15.8	724.0	69.5	17.1

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Table 1. Continued

NPT	RUN	IV	JZ	LUDIR		UT	P
52	013	26	12	1	2	36.754	17.054

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
27	013	1	6.299	-1.000	1.082	0.951	0.033	0.425	21.0	45.2	736.1	25.7	46.1
28	013	2	6.301	-0.981	1.082	0.954	0.035	0.428	21.8	47.4	736.1	23.0	47.8
29	013	3	6.302	-0.840	1.079	0.945	0.042	0.438	36.7	67.6	736.1	37.7	68.0
30	013	4	6.302	-0.699	1.082	0.949	0.060	0.432	16.1	61.1	736.1	19.2	61.9
31	013	5	6.303	-0.630	1.076	0.957	0.056	0.417	-5.3	36.6	736.1	7.9	37.5
32	013	6	6.304	-0.559	1.074	0.963	0.075	0.409	-29.7	27.0	736.1	32.1	27.6
33	013	7	6.301	-0.489	1.080	0.944	0.080	0.397	-38.6	21.9	724.0	40.2	23.5
34	013	8	6.300	-0.419	1.078	0.949	0.092	0.392	-53.4	15.6	720.0	54.1	16.6
35	013	9	6.298	-0.349	1.080	0.948	0.095	0.378	-74.3	-1.9	720.0	76.2	13.9
36	013	10	6.303	-0.279	1.077	0.948	0.126	0.358	-118.3	-21.8	716.0	119.2	22.9
37	013	11	6.301	-0.210	1.079	0.945	0.121	0.340	-137.6	-44.8	712.0	138.2	46.6
38	013	12	6.305	-0.140	1.076	0.954	0.155	0.298	-217.4	-97.9	706.0	217.8	98.8
39	013	13	6.301	-0.070	1.078	0.955	0.169	0.240	-299.0	-169.6	688.0	299.4	170.1
40	013	14	6.300	-0.000	1.078	0.974	0.162	0.181	-381.3	-256.0	680.0	-381.3	-97.1
41	013	15	6.298	0.070	1.087	0.975	0.014	0.141	-351.3	-339.5	676.0	-351.3	-339.5
42	013	16	6.298	0.140	1.087	0.961	-0.063	0.220	-195.7	-243.4	686.0	-195.7	-243.4
43	013	17	6.298	0.210	1.085	0.958	-0.134	0.289	-64.0	-167.2	706.0	-64.0	-167.2
44	013	18	6.301	0.281	1.082	0.975	-0.119	0.298	-69.4	-160.3	714.0	72.2	160.7
45	013	19	6.303	0.349	1.077	0.967	-0.119	0.325	-29.5	-120.6	716.0	35.9	121.5
46	013	20	6.302	0.420	1.077	0.970	-0.106	0.332	-29.7	-111.2	724.0	33.5	111.7
47	013	21	6.301	0.491	1.078	0.966	-0.116	0.370	27.7	-61.4	724.0	28.5	62.4
48	013	22	6.303	0.560	1.079	0.964	-0.114	0.370	27.5	-59.7	724.0	28.5	59.9
49	013	23	6.303	0.631	1.074	0.965	-0.105	0.374	26.2	-54.3	724.0	28.8	54.8
50	013	24	6.299	0.699	1.085	0.954	-0.107	0.382	43.8	-39.0	726.0	44.7	39.7
51	013	25	6.299	0.839	1.090	0.954	-0.084	0.396	49.3	-15.9	726.0	51.3	17.7
52	013	26	6.299	0.980	1.089	0.948	-0.078	0.411	68.5	7.8	730.1	68.8	9.7

Table 1. Continued

NPT	RUN	IV	JZ	LVDIR		UT		P
26	016	26	13	1	2	35.677		16.266

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSD	RMSG
1	016	1	6.313	-0.997	1.166	0.947	0.016	0.431	40.4	51.8	726.0	41.8	53.3
2	016	2	6.315	-0.980	1.161	0.959	0.020	0.426	24.7	39.0	726.0	25.1	40.1
3	016	3	6.316	-0.841	1.161	0.957	0.025	0.419	14.6	32.6	726.0	15.9	35.0
4	016	4	6.316	-0.701	1.158	0.952	0.035	0.412	2.0	27.6	726.0	6.1	30.4
5	016	5	6.315	-0.631	1.158	0.950	0.054	0.409	-11.3	28.5	718.0	14.5	29.5
6	016	6	6.316	-0.561	1.156	0.945	0.060	0.408	-12.7	31.7	718.0	14.3	32.8
7	016	7	6.316	-0.491	1.160	0.350	0.073	0.394	-41.1	13.1	718.0	42.1	15.0
8	016	8	6.317	-0.420	1.154	0.946	0.082	0.386	-54.4	7.4	714.0	54.9	9.0
9	016	9	6.316	-0.350	1.162	0.944	0.101	0.375	-78.4	-2.3	714.0	79.8	10.1
10	016	10	6.318	-0.280	1.158	0.945	0.122	0.361	-109.1	-16.7	710.0	111.0	22.5
11	016	11	6.315	-0.211	1.159	0.959	0.143	0.350	-141.4	-34.1	708.0	141.6	36.2
12	016	12	6.317	-0.138	1.156	0.953	0.191	0.327	-194.7	-51.1	700.0	194.8	68.7
13	016	13	6.318	-0.069	1.156	0.965	0.078	0.272	-207.7	-149.2	692.0	-207.7	-149.2
14	016	14	6.317	-0.000	1.155	0.969	0.052	0.204	-285.5	-245.4	682.0	-285.5	-245.4
15	016	15	6.316	0.068	1.157	0.971	-0.050	0.212	-215.7	-253.4	682.0	-215.7	-253.4
16	016	16	6.315	0.139	1.160	0.974	-0.102	0.257	-129.9	-207.3	696.0	-129.9	-207.3
17	016	17	6.317	0.210	1.160	0.958	-0.107	0.288	-80.0	-161.2	696.0	-80.0	-161.2
18	016	18	6.317	0.280	1.153	0.962	-0.099	0.319	-46.1	-121.2	706.0	-46.1	-121.2
19	016	19	6.314	0.348	1.163	0.960	-0.094	0.338	-24.1	-95.1	706.0	-24.1	-95.1
20	016	20	6.315	0.419	1.160	0.965	-0.114	0.343	-8.2	-95.1	716.0	-8.2	-95.1
21	016	21	6.315	0.489	1.157	0.947	0.010	0.396	-2.0	5.1	716.0	-2.0	5.1
22	016	22	6.318	0.558	1.156	0.959	-0.070	0.372	7.0	-47.2	720.0	10.7	48.9
23	016	23	6.317	0.629	1.157	0.957	-0.063	0.385	20.8	-28.1	722.0	22.3	30.9
24	016	24	6.318	0.699	1.152	0.964	-0.062	0.390	22.6	-24.8	726.0	27.6	26.8
25	016	25	6.316	0.837	1.157	0.957	-0.051	0.396	28.9	-10.9	726.0	30.0	13.2
26	016	26	6.317	0.976	1.159	0.962	-0.045	0.400	26.9	-7.7	726.0	28.1	9.7

Table 1. Concluded

NPT	RUN	IY	JZ	LUDIR		UT	P
52	016	26	14	1	2	36.049	16.607

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
27	016	1	6.301	-1.000	1.321	0.925	0.026	0.412	23.1	42.2	720.0	24.5	43.9
28	016	2	6.299	-0.981	1.323	0.946	0.022	0.404	2.4	18.5	720.0	6.6	20.2
29	016	3	6.299	-0.841	1.323	0.949	0.012	0.408	12.5	20.4	724.0	14.8	23.0
30	016	4	6.302	-0.701	1.322	0.967	0.032	0.405	-12.3	11.2	724.0	14.0	12.8
31	016	5	6.299	-0.631	1.322	0.960	0.046	0.393	-32.6	1.4	722.0	34.1	4.7
32	016	6	6.302	-0.562	1.322	0.955	0.058	0.389	-42.2	0.9	718.0	43.3	3.4
33	016	7	6.302	-0.490	1.318	0.954	0.058	0.386	-44.7	-1.4	716.0	46.2	6.3
34	016	8	6.303	-0.421	1.315	0.956	0.082	0.376	-72.9	-11.5	714.0	73.1	15.5
35	016	9	6.301	-0.352	1.322	0.945	0.070	0.368	-70.5	-18.1	714.0	71.2	20.3
36	016	10	6.301	-0.280	1.319	0.958	0.065	0.343	-107.4	-58.4	714.0	108.0	60.2
37	016	11	6.302	-0.209	1.322	0.956	0.073	0.347	-104.4	-50.0	708.0	104.6	55.0
38	016	12	6.303	-0.140	1.320	0.941	0.065	0.334	-109.5	-60.3	700.0	110.1	62.6
39	016	13	6.303	-0.071	1.321	0.966	0.076	0.317	-150.5	-93.1	708.0	-150.5	-93.1
40	016	14	6.301	-0.002	1.324	0.968	0.011	0.289	-151.8	-143.2	704.0	-151.8	-143.2
41	016	15	6.302	0.070	1.323	0.970	0.005	0.290	-146.6	-143.2	704.0	-146.6	-143.2
42	016	16	6.302	0.139	1.320	0.971	-0.017	0.301	-119.9	-133.2	706.0	-119.9	-133.2
43	016	17	6.305	0.209	1.318	0.970	-0.041	0.325	-76.1	-107.2	712.0	-76.1	-107.2
44	016	18	6.305	0.280	1.315	0.990	-0.045	0.333	-72.4	-105.0	712.0	72.5	160.3
45	016	19	6.302	0.351	1.322	0.968	-0.068	0.331	-51.8	-104.0	716.0	52.8	104.2
46	016	20	6.301	0.419	1.320	0.951	-0.089	0.355	1.0	-67.7	716.0	12.4	68.5
47	016	21	6.300	0.489	1.322	0.961	-0.073	0.356	-12.5	-68.9	720.0	17.3	69.6
48	016	22	6.306	0.560	1.312	0.957	-0.068	0.362	-6.1	-58.6	720.0	8.8	60.4
49	016	23	6.302	0.629	1.319	0.952	-0.059	0.383	19.3	-26.7	720.0	20.9	28.6
50	016	24	6.302	0.701	1.322	0.965	-0.060	0.374	0.4	-45.8	722.0	6.6	46.2
51	016	25	6.303	0.839	1.321	0.962	-0.073	0.407	51.6	-4.4	728.0	52.0	6.4
52	016	26	6.302	0.979	1.320	0.966	-0.052	0.399	28.1	-12.1	728.0	28.4	13.6

STOP --

Table 2. Vorticities and Circulations for 22.5° Pitch Angle and X = 6.3

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	1	-0.991	0.403	0.001470	-0.000179	-0.1217
2	1	-0.910	0.403	0.010253	0.000701	0.0684
3	1	-0.770	0.401	0.010826	0.001565	0.1446
4	1	-0.665	0.399	0.005751	0.000694	0.1206
5	1	-0.595	0.398	0.005849	-0.000602	-0.1030
6	1	-0.525	0.398	0.005829	0.001962	0.3367
7	1	-0.454	0.397	0.005452	0.005921	1.0860

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	2	-0.991	0.478	0.001474	0.000517	0.3509
2	2	-0.911	0.478	0.010920	-0.000676	-0.0619
3	2	-0.770	0.480	0.011225	-0.001286	-0.1146
4	2	-0.665	0.479	0.005445	-0.002100	-0.3856
5	2	-0.595	0.479	0.005424	-0.001787	-0.3295
6	2	-0.525	0.479	0.005560	-0.002943	-0.5293
7	2	-0.455	0.478	0.005854	-0.001302	-0.2225
8	2	-0.385	0.478	0.005767	0.004529	0.7853
9	2	-0.315	0.481	0.0059	-0.0226	-3.8
10	2	-0.253	0.483	0.0047	-0.0077	-1.6

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	3	-0.990	0.540	0.000878	0.000719	0.8191
2	3	-0.910	0.540	0.006581	-0.002004	-0.3045
3	3	-0.770	0.541	0.005995	0.000335	0.0559
4	3	-0.665	0.540	0.002939	0.000455	0.1548
5	3	-0.596	0.537	0.002791	0.000386	0.1382
6	3	-0.525	0.538	0.002878	0.001800	0.6253
7	3	-0.454	0.539	0.002729	0.000506	0.1854
8	3	-0.385	0.540	0.002759	-0.000707	-0.2564
9	3	-0.315	0.543	0.002812	-0.009507	-3.3803
10	3	-0.245	0.544	0.002437	-0.005875	-2.4109
11	3	-0.175	0.537	0.002703	-0.004856	-1.7965
12	3	-0.106	0.540	0.002675	0.004025	1.5047
13	3	-0.037	0.543	0.002674	0.017644	6.5985
14	3	0.033	0.540	0.003060	0.014269	4.6622
15	3	0.103	0.541	0.002859	0.004665	1.6316

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	4	-0.990	0.583	0.000776	0.000066	0.0852
2	4	-0.910	0.583	0.005414	0.000238	0.0440
3	4	-0.770	0.580	0.004966	-0.000187	-0.0377
4	4	-0.665	0.578	0.002303	0.000111	0.0481
5	4	-0.595	0.577	0.002722	0.001138	0.4181
6	4	-0.525	0.580	0.003105	-0.000044	-0.0142
7	4	-0.455	0.582	0.003130	0.000540	0.1725
8	4	-0.385	0.581	0.003103	0.001120	0.3610
9	4	-0.314	0.583	0.002821	-0.006432	-2.2801
10	4	-0.245	0.581	0.002760	-0.007836	-2.8392
11	4	-0.175	0.576	0.002644	-0.015301	-5.7873
12	4	-0.105	0.578	0.002617	-0.024496	-9.3594
13	4	-0.035	0.583	0.002791	-0.019264	-6.9030
14	4	0.035	0.582	0.002774	-0.009146	-3.2975
15	4	0.105	0.582	0.002809	-0.000213	-0.0757
16	4	0.175	0.581	0.002909	0.006573	2.2594
17	4	0.245	0.579	0.002686	0.006971	2.5960
18	4	0.314	0.578	0.002564	0.006875	2.6810
19	4	0.385	0.585	0.002421	0.003834	1.5833

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	5	-0.990	0.621	0.000724	-0.000211	-0.2917
2	5	-0.910	0.620	0.005262	0.002922	0.5552
3	5	-0.769	0.621	0.006300	0.004082	0.6479
4	5	-0.665	0.617	0.003079	0.000646	0.2099
5	5	-0.595	0.617	0.002947	-0.000069	-0.0235
6	5	-0.525	0.621	0.002631	-0.000156	-0.0595
7	5	-0.455	0.621	0.002310	-0.001187	-0.5141
8	5	-0.385	0.621	0.002538	-0.002315	-0.9120
9	5	-0.315	0.623	0.002740	-0.001316	-0.4802
10	5	-0.245	0.621	0.002878	-0.006102	-2.1203
11	5	-0.175	0.617	0.003235	-0.003338	-1.0319
12	5	-0.105	0.618	0.002877	-0.005830	-2.0264
13	5	-0.035	0.623	0.002881	-0.004638	-1.6097
14	5	0.035	0.623	0.002909	-0.000011	-0.0039
15	5	0.104	0.621	0.002828	0.010260	3.6275
16	5	0.175	0.621	0.002671	0.015528	5.8132
17	5	0.245	0.620	0.003016	0.010688	3.5438
18	5	0.314	0.618	0.002931	0.009146	3.1202
19	5	0.385	0.619	0.002529	0.005158	2.0553

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Table 2. Continued

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	6	-0.990	0.662	0.000878	0.000241	0.2741
2	6	-0.910	0.660	0.005708	-0.001502	-0.2631
3	6	-0.770	0.659	0.004401	-0.005704	-1.2961
4	6	-0.665	0.656	0.002398	-0.000583	-0.2433
5	6	-0.595	0.658	0.002786	0.000416	0.1494
6	6	-0.525	0.661	0.002925	-0.002243	-0.7668
7	6	-0.455	0.659	0.003091	0.000903	0.2920
8	6	-0.385	0.660	0.002829	0.003052	1.0788
9	6	-0.315	0.659	0.002351	-0.002552	-1.0852
10	6	-0.245	0.660	0.002514	-0.011992	-4.7703
11	6	-0.175	0.661	0.003021	-0.008494	-2.8114
12	6	-0.106	0.659	0.002806	-0.011618	-4.1408
13	6	-0.035	0.659	0.002285	-0.005794	-2.5350
14	6	0.035	0.661	0.002330	0.000037	0.0159
15	6	0.104	0.662	0.002837	0.003865	1.3626
16	6	0.175	0.659	0.002663	0.011388	4.2761
17	6	0.245	0.663	0.002954	0.009643	3.2645
18	6	0.315	0.664	0.003607	0.007954	2.2053
19	6	0.385	0.661	0.003466	0.001764	0.5088
20	6	0.455	0.660	0.003258	0.000442	0.1356
21	6	0.524	0.659	0.003269	0.000660	0.2019
22	6	0.595	0.660	0.003445	0.001877	0.5443
23	6	0.666	0.658	0.003019	0.002663	0.8820

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	8	-0.990	0.805	0.001696	0.000449	0.2647
2	8	-0.910	0.805	0.011234	0.000120	0.0107
3	8	-0.770	0.803	0.011752	-0.000359	-0.0305
4	8	-0.665	0.801	0.006320	-0.000255	-0.0403
5	8	-0.595	0.801	0.006500	-0.001067	-0.1642
6	8	-0.524	0.800	0.006514	-0.000773	-0.1187
7	8	-0.455	0.800	0.006127	-0.000368	-0.0600
8	8	-0.385	0.798	0.005895	0.000018	0.0030
9	8	-0.315	0.799	0.005433	-0.000856	-0.1576
10	8	-0.245	0.800	0.005003	0.000433	0.0865
11	8	-0.175	0.798	0.005548	-0.002430	-0.4380
12	8	-0.106	0.797	0.005958	-0.001756	-0.2947
13	8	-0.035	0.798	0.005530	0.003219	0.5822
14	8	0.035	0.802	0.005387	0.010238	1.9004
15	8	0.105	0.802	0.005429	0.010208	1.8803
16	8	0.175	0.798	0.004851	0.012329	2.5415
17	8	0.245	0.797	0.004816	0.009848	2.0445
18	8	0.315	0.800	0.005196	0.006144	1.1826
19	8	0.385	0.800	0.005099	0.002415	0.4736
20	8	0.455	0.799	0.005379	0.002398	0.4458
21	8	0.525	0.799	0.005457	-0.001418	-0.2599
22	8	0.595	0.801	0.005318	-0.000451	-0.0848
23	8	0.665	0.798	0.004996	0.000450	0.0900
24	8	0.770	0.800	0.010097	0.000674	0.0667
25	8	0.910	0.804	0.010958	-0.003317	-0.3027

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	7	-0.990	0.724	0.001639	0.000174	0.1064
2	7	-0.910	0.722	0.011778	-0.002634	-0.2236
3	7	-0.770	0.718	0.012237	0.002483	0.2029
4	7	-0.665	0.715	0.005741	-0.001684	-0.2934
5	7	-0.595	0.716	0.005405	0.001558	0.2883
6	7	-0.525	0.717	0.005015	0.001135	0.2264
7	7	-0.455	0.719	0.005207	-0.000626	-0.1203
8	7	-0.385	0.718	0.005342	-0.002574	-0.4819
9	7	-0.315	0.718	0.005942	0.001035	0.1742
10	7	-0.245	0.721	0.005959	-0.013123	-2.2023
11	7	-0.175	0.721	0.005229	-0.023704	-4.5331
12	7	-0.106	0.717	0.005266	-0.022752	-4.3207
13	7	-0.035	0.717	0.005889	-0.021321	-3.6202
14	7	0.034	0.721	0.005857	-0.010307	-1.7598
15	7	0.104	0.722	0.005739	0.010405	1.8130
16	7	0.175	0.721	0.006030	0.022470	3.7262
17	7	0.245	0.724	0.005420	0.017504	3.2294
18	7	0.315	0.726	0.005128	0.009301	1.8137
19	7	0.385	0.725	0.005441	-0.003257	-0.5985
20	7	0.455	0.722	0.005419	-0.003826	-0.7060
21	7	0.525	0.721	0.005351	-0.001149	-0.2147
22	7	0.595	0.724	0.005529	0.000780	0.1410
23	7	0.665	0.721	0.005817	-0.002353	-0.4044
24	7	0.771	0.718	0.012851	-0.000074	-0.0058
25	7	0.911	0.721	0.012086	0.004500	0.3723

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	9	-0.990	0.883	0.001452	0.000381	0.2626
2	9	-0.910	0.882	0.010343	-0.000871	-0.0842
3	9	-0.770	0.882	0.010405	0.000417	0.0400
4	9	-0.665	0.884	0.005270	0.000370	0.0702
5	9	-0.595	0.884	0.005302	0.000052	0.0098
6	9	-0.525	0.884	0.005188	0.000252	0.0485
7	9	-0.455	0.882	0.005245	0.000275	0.0525
8	9	-0.385	0.879	0.005436	-0.000489	-0.0900
9	9	-0.315	0.881	0.005883	0.000622	0.1057
10	9	-0.245	0.884	0.006854	0.003303	0.4819
11	9	-0.175	0.884	0.006351	-0.006095	-0.9597
12	9	-0.105	0.883	0.006042	-0.013965	-2.3113
13	9	-0.035	0.880	0.006056	-0.007038	-1.1622
14	9	0.035	0.881	0.005725	0.010802	1.8869
15	9	0.105	0.881	0.005677	0.017313	3.0496
16	9	0.175	0.877	0.006217	0.014317	2.3030
17	9	0.245	0.877	0.006112	0.004617	0.7553
18	9	0.314	0.880	0.006110	-0.000739	-0.1210
19	9	0.385	0.880	0.006113	-0.000158	-0.0259
20	9	0.456	0.879	0.005879	-0.001654	-0.2814
21	9	0.525	0.880	0.005755	-0.000822	-0.1429
22	9	0.595	0.880	0.005788	-0.000819	-0.1414
23	9	0.665	0.877	0.006152	-0.000340	-0.0552
24	9	0.770	0.879	0.012053	-0.002371	-0.1967
25	9	0.910	0.883	0.011097	-0.002922	-0.2633

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Table 2. Concluded

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	10	-0.980	1.001	0.003127	0.000699	0.2236
2	10	-0.910	0.999	0.022780	0.001288	0.0565
3	10	-0.770	1.000	0.022518	0.002134	0.0947
4	10	-0.665	1.000	0.010928	-0.000060	-0.0055
5	10	-0.595	0.998	0.010795	0.001466	0.1358
6	10	-0.524	0.999	0.010978	-0.001778	-0.1620
7	10	-0.455	0.999	0.011098	0.000057	0.0052
8	10	-0.384	0.998	0.011442	0.002227	0.1946
9	10	-0.314	1.001	0.010903	0.000690	0.0633
10	10	-0.244	1.005	0.010093	-0.001461	-0.1448
11	10	-0.175	1.004	0.010274	-0.002908	-0.2831
12	10	-0.105	1.002	0.010562	-0.016472	-1.5595
13	10	-0.035	1.001	0.010815	-0.016702	-1.5443
14	10	0.035	1.002	0.011271	-0.009777	-0.8674
15	10	0.105	1.004	0.011581	0.007602	0.6564
16	10	0.175	1.004	0.011667	0.008453	0.7245
17	10	0.245	1.002	0.011321	0.002493	0.2202
18	10	0.315	1.001	0.010906	0.002093	0.1919
19	10	0.385	1.000	0.010924	0.001364	0.1249
20	10	0.456	0.999	0.011087	0.001952	0.1760
21	10	0.525	1.000	0.010872	0.000475	0.0437
22	10	0.595	0.999	0.011052	0.000805	0.0728
23	10	0.665	1.000	0.010972	0.000715	0.0652
24	10	0.770	1.005	0.023049	0.001898	0.0824
25	10	0.909	1.006	0.023534	0.002814	0.1196

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	11	-0.989	1.123	0.001508	0.000165	0.1092
2	11	-0.910	1.121	0.011207	0.001910	0.1705
3	11	-0.770	1.120	0.011140	0.001999	0.1795
4	11	-0.665	1.118	0.005504	0.000161	0.0292
5	11	-0.595	1.116	0.005781	0.000199	0.0345
6	11	-0.525	1.118	0.005674	-0.000227	-0.0399
7	11	-0.455	1.118	0.005510	0.000076	0.0137
8	11	-0.385	1.119	0.005521	-0.000704	-0.1276
9	11	-0.314	1.119	0.005745	-0.001187	-0.2066
10	11	-0.245	1.118	0.005543	-0.001507	-0.2719
11	11	-0.175	1.118	0.005724	-0.003814	-0.6663
12	11	-0.104	1.117	0.005535	-0.002150	-0.3885
13	11	-0.035	1.117	0.005331	0.001671	0.3135
14	11	0.034	1.119	0.005057	0.003954	0.7819
15	11	0.104	1.123	0.005019	0.006730	1.3408
16	11	0.175	1.123	0.005159	0.003440	0.6668
17	11	0.246	1.120	0.005135	-0.000129	-0.0251
18	11	0.315	1.119	0.005313	0.000175	0.0329
19	11	0.384	1.119	0.005962	-0.000057	-0.0096
20	11	0.455	1.118	0.005712	-0.000454	-0.0795
21	11	0.525	1.118	0.005377	-0.005594	-1.0404
22	11	0.595	1.117	0.005657	-0.001959	-0.3462
23	11	0.665	1.117	0.005193	-0.002129	-0.4100
24	11	0.769	1.121	0.009356	-0.003977	-0.4251
25	11	0.908	1.124	0.009578	-0.003342	-0.3490

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	12	-0.989	1.243	0.002925	-0.001038	-0.3550
2	12	-0.911	1.242	0.022566	0.000484	0.0214
3	12	-0.771	1.241	0.022891	0.000200	0.0087
4	12	-0.666	1.240	0.011441	-0.000727	-0.0636
5	12	-0.596	1.240	0.011445	-0.000065	-0.0056
6	12	-0.526	1.239	0.011555	-0.000661	-0.0572
7	12	-0.455	1.237	0.011175	-0.000817	-0.0731
8	12	-0.386	1.238	0.011079	-0.000312	-0.0282
9	12	-0.315	1.240	0.011455	-0.000032	-0.0028
10	12	-0.245	1.240	0.011298	0.003292	0.2914
11	12	-0.175	1.240	0.011512	0.003307	0.2873
12	12	-0.105	1.238	0.011471	-0.001221	-0.1065
13	12	-0.035	1.239	0.011536	-0.005499	-0.4767
14	12	0.034	1.240	0.011743	0.000249	0.0212
15	12	0.104	1.240	0.011398	-0.000270	-0.0237
16	12	0.174	1.239	0.011256	-0.000816	-0.0725
17	12	0.245	1.236	0.011302	-0.000767	-0.0679
18	12	0.315	1.238	0.011108	-0.001243	-0.1119
19	12	0.384	1.241	0.011146	0.000518	0.0465
20	12	0.454	1.240	0.011319	0.005276	0.4662
21	12	0.524	1.237	0.011264	0.001000	0.0888
22	12	0.594	1.236	0.011125	0.002086	0.1875
23	12	0.665	1.238	0.011740	-0.000468	-0.0398
24	12	0.769	1.238	0.023011	0.003915	0.1701
25	12	0.908	1.239	0.022636	0.001427	0.0631

STOP --

Table 3. Flow Field Velocities at 37.5° Pitch Angle and X = 2.8

NPT	RUN	IY	JZ	LUDIR	UT	P
138	025	7	1	1 2	36.168	16.747

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
116	025	1	2.800	-0.979	0.500	0.816	0.041	0.763	129.5	159.2	787.4	129.5	159.2
117	025	2	2.800	-0.841	0.498	0.822	0.059	0.787	139.5	183.3	797.9	139.5	183.3
118	025	3	2.799	-0.701	0.501	0.842	0.075	0.820	149.4	205.3	822.2	149.4	205.3
119	025	4	2.802	-0.560	0.497	0.837	0.107	0.835	153.4	233.3	828.2	153.4	233.3
120	025	5	2.799	-0.490	0.499	0.832	0.141	0.843	147.4	253.4	828.2	147.4	253.4
121	025	6	2.798	-0.421	0.500	0.838	0.212	0.862	121.5	281.4	838.2	121.5	281.4
122	025	7	2.794	-0.352	0.510	0.781	0.364	0.844	65.6	341.5	797.0	65.6	341.5

NPT	RUN	IY	JZ	LUDIR	UT	P
115	025	17	2	1 2	36.353	16.919

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
93	025	1	2.795	-0.979	0.556	0.850	0.009	0.729	81.1	86.7	793.5	81.2	86.9
94	025	2	2.798	-0.840	0.554	0.930	0.070	0.633	112.9	-156.4	783.8	113.5	161.5
95	025	3	2.795	-0.699	0.556	0.843	0.070	0.774	100.1	151.7	797.2	101.8	152.2
96	025	4	2.797	-0.555	0.554	0.738	0.117	0.733	117.5	205.2	723.1	117.8	205.7
97	025	5	2.799	-0.490	0.552	0.832	0.147	0.820	117.3	227.3	814.2	117.3	227.3
98	025	6	2.801	-0.421	0.550	0.823	0.178	0.836	125.8	259.4	816.2	125.8	259.4
99	025	7	2.799	-0.349	0.552	0.812	0.215	0.878	159.4	321.5	828.2	159.4	321.5
100	025	8	2.802	-0.280	0.550	0.877	0.146	0.778	33.7	143.2	820.2	33.7	143.2
101	025	9	2.803	-0.210	0.548	1.130	-0.120	0.383	-473.0	-563.8	800.2	-473.0	-563.8
102	025	10	2.804	-0.141	0.547	1.183	0.041	0.027	-1003.7	-968.4	672.0	-1003.7	-968.4
103	025	11	2.799	-0.070	0.553	1.142	0.090	-0.109	-1147.4	-1074.5	589.8	-1147.4	-1074.5
104	025	12	2.802	-0.001	0.548	1.064	0.201	-0.156	-1205.2	-1046.5	529.8	-1205.2	-1046.5
105	025	13	2.804	0.071	0.547	1.036	0.422	-0.175	-1328.9	-1000.4	505.7	-1328.9	-1000.4
106	025	14	2.804	0.140	0.546	1.053	0.509	-0.239	-1458.6	-1064.5	485.7	-1458.6	-1064.5
107	025	15	2.797	0.210	0.556	0.989	0.756	-0.080	-1366.8	-786.1	517.7	-1366.8	-786.1
108	025	16	2.799	0.279	0.554	0.993	0.797	0.389	-876.0	-263.4	724.0	-876.0	-263.4
109	025	17	2.795	0.351	0.555	0.933	0.462	0.649	-343.4	13.0	808.2	-343.4	13.0

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Table 3. Continued

NPT	RUN	IY	JZ	LUDIR	UT	P
23	025	20	3	1 2	35.401	16.045

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	025	1	2.795	-0.980	0.602	0.835	0.055	0.733	70.6	111.3	775.6	70.7	111.6
2	025	2	2.797	-0.841	0.600	0.824	0.077	0.765	103.4	161.2	789.5	103.7	161.5
3	025	3	2.801	-0.699	0.600	0.831	0.109	0.769	83.7	165.8	797.6	83.9	166.2
4	025	4	2.803	-0.561	0.595	0.845	0.183	0.797	59.6	197.0	808.2	60.1	197.3
5	025	5	2.799	-0.491	0.597	0.831	0.195	0.796	64.5	212.7	808.2	65.3	213.5
6	025	6	2.796	-0.420	0.604	0.807	0.288	0.842	82.9	302.2	816.2	85.5	302.8
7	025	7	2.795	-0.349	0.605	0.817	0.238	0.876	139.5	317.5	824.2	139.5	317.5
8	025	8	2.797	-0.280	0.603	0.847	0.208	0.743	-16.2	141.2	792.1	-16.2	141.2
9	025	9	2.799	-0.209	0.602	1.125	0.152	0.583	-397.2	-281.4	872.3	-397.2	-281.4
10	025	10	2.800	-0.139	0.596	1.159	0.103	0.174	-856.1	-774.1	722.0	-856.1	-774.1
11	025	11	2.804	-0.070	0.596	1.174	0.251	-0.257	-1424.7	-1228.8	541.8	-1424.7	-1228.8
12	025	12	2.806	0.001	0.591	1.126	0.274	-0.262	-1408.7	-1194.7	515.7	-1408.7	-1194.7
13	025	13	2.800	0.071	0.597	1.037	0.339	-0.341	-1448.6	-1186.7	429.6	-1448.6	-1186.7
14	025	14	2.798	0.140	0.600	1.064	0.504	-0.378	-1632.2	-1238.8	435.6	-1632.2	-1238.8
15	025	15	2.806	0.209	0.593	1.280	0.306	-0.165	-1456.6	-1216.8	645.9	-1456.6	-1216.8
16	025	16	2.796	0.279	0.602	1.245	0.420	0.316	-953.9	-629.9	832.2	-953.9	-629.9
17	025	17	2.795	0.350	0.602	0.919	-0.161	0.778	173.4	49.1	848.2	173.4	49.1
18	025	18	2.799	0.419	0.600	0.831	-0.345	0.877	460.7	197.3	832.2	460.7	197.3
19	025	19	2.805	0.490	0.594	0.790	-0.369	0.883	514.5	233.3	812.2	514.5	233.3
20	025	20	2.805	0.560	0.595	0.831	-0.291	0.811	358.9	135.2	810.2	358.9	135.2

NPT	RUN	IY	JZ	LUDIR	UT	P
92	025	23	4	1 2	36.303	16.873

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
70	025	1	2.800	-0.980	0.653	0.834	0.023	0.749	108.1	124.4	787.7	108.7	124.8
71	025	2	2.801	-0.840	0.649	0.859	0.033	0.736	66.5	90.8	799.0	67.1	91.2
72	025	3	2.801	-0.700	0.649	0.838	0.083	0.759	81.5	144.1	796.3	82.0	144.3
73	025	4	2.800	-0.560	0.649	0.843	0.128	0.752	43.9	140.7	796.0	44.8	140.9
74	025	5	2.800	-0.491	0.651	0.871	0.134	0.739	0.8	102.7	808.7	8.8	103.4
75	025	6	2.802	-0.415	0.650	0.850	0.174	0.785	46.4	176.6	802.9	51.8	176.9
76	025	7	2.801	-0.349	0.650	0.837	0.245	0.808	69.5	255.4	798.0	69.5	255.4
77	025	8	2.801	-0.279	0.653	0.737	0.254	0.794	107.5	299.4	751.3	107.5	299.4
78	025	9	2.801	-0.209	0.652	0.835	0.463	0.644	-263.6	91.1	746.1	-263.6	91.1
79	025	10	2.802	-0.139	0.650	0.985	0.598	0.227	-927.9	-471.7	643.9	-927.9	-471.7
80	025	11	2.800	-0.068	0.650	1.124	0.422	0.001	-1197.3	-872.3	625.9	-1197.3	-872.3
81	025	12	2.800	0.000	0.652	1.077	0.543	-0.066	-1311.0	-890.3	575.8	-1311.0	-890.3
82	025	13	2.801	0.070	0.649	1.099	0.296	-0.273	-1416.7	-1184.7	497.7	-1416.7	-1184.7
83	025	14	2.802	0.140	0.648	1.165	0.223	-0.371	-1548.4	-1371.0	495.7	-1548.4	-1371.0
84	025	15	2.803	0.210	0.649	1.240	0.221	-0.178	-1370.8	-1198.7	609.9	-1370.8	-1198.7
85	025	16	2.801	0.279	0.648	1.175	0.155	0.540	-493.0	-373.5	890.3	-493.0	-373.5
86	025	17	2.800	0.350	0.652	0.999	-0.017	0.844	95.6	81.1	916.3	95.6	81.1
87	025	18	2.801	0.420	0.653	0.923	-0.198	0.897	321.0	169.2	890.3	321.0	169.2
88	025	19	2.800	0.490	0.652	0.851	-0.372	0.912	496.6	213.3	858.2	496.6	213.3
89	025	20	2.801	0.560	0.649	0.853	-0.312	0.851	396.8	157.2	840.2	396.8	157.2
90	025	21	2.803	0.700	0.649	0.867	-0.196	0.812	273.1	123.2	824.2	273.1	123.2
91	025	22	2.801	0.842	0.654	0.871	-0.143	0.797	223.3	113.2	822.2	223.3	113.2
92	025	23	2.793	0.975	0.662	0.829	-0.101	0.751	185.3	107.2	784.1	185.3	107.2

Table 3. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
46	025	23	6	1	2	36.419	16.980

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
24	025	1	2.797	-0.979	0.756	0.848	0.022	0.703	44.8	60.6	766.6	48.8	61.3
25	025	2	2.797	-0.838	0.755	0.843	0.054	0.718	47.9	87.5	772.9	48.8	88.0
26	025	3	2.801	-0.700	0.752	0.857	0.092	0.712	7.3	75.4	772.9	11.4	76.0
27	025	4	2.800	-0.560	0.753	0.843	0.127	0.709	-4.5	91.0	769.4	9.3	91.3
28	025	5	2.797	-0.489	0.754	0.864	0.151	0.704	-41.7	72.1	777.9	43.4	72.3
29	025	6	2.799	-0.421	0.753	0.843	0.214	0.699	-65.6	96.2	768.3	66.5	96.4
30	025	7	2.797	-0.351	0.754	0.871	0.245	0.636	-173.8	9.7	747.3	174.4	15.0
31	025	8	2.800	-0.279	0.751	0.870	0.339	0.605	-260.5	-5.6	733.9	260.9	9.4
32	025	9	2.802	-0.210	0.750	0.867	0.477	0.472	-484.5	-123.2	680.8	-484.5	-123.2
33	025	10	2.797	-0.141	0.754	0.867	0.412	0.265	-673.6	-361.5	589.9	-673.6	-361.5
34	025	11	2.799	-0.070	0.756	0.951	0.414	0.120	-904.0	-589.8	574.7	-904.0	-589.8
35	025	12	2.799	-0.001	0.756	0.999	0.351	0.004	-1043.6	-774.1	555.8	-1043.6	-774.1
36	025	13	2.802	0.070	0.751	1.086	0.173	-0.197	-1227.2	-1092.6	513.7	-1227.2	-1092.6
37	025	14	2.798	0.140	0.753	1.059	-0.087	-0.275	-1173.3	-1234.8	479.6	-1173.3	-1234.8
38	025	15	2.799	0.210	0.754	1.116	-0.115	0.004	-882.0	-966.4	623.9	-882.0	-966.4
39	025	16	2.798	0.279	0.753	1.066	-0.447	0.472	-127.9	-465.7	792.1	-127.9	-465.7
40	025	17	2.799	0.350	0.753	0.932	-0.632	0.700	345.0	-137.2	818.2	345.0	-137.2
41	025	18	2.803	0.421	0.750	0.865	-0.565	0.804	480.6	47.1	828.2	480.6	47.1
42	025	19	2.806	0.490	0.747	0.866	-0.403	0.835	420.8	111.2	840.2	420.8	111.2
43	025	20	2.800	0.559	0.752	0.813	-0.372	0.782	388.8	103.1	788.1	388.8	103.1
44	025	21	2.796	0.700	0.755	0.804	-0.251	0.743	285.1	91.1	772.1	285.1	91.1
45	025	22	2.800	0.841	0.751	0.808	-0.165	0.720	207.3	79.1	764.1	207.3	79.1
46	025	23	2.802	0.981	0.753	0.805	-0.129	0.721	189.3	89.1	760.1	189.3	89.1

Table 3. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
69	025	23	5	1	2	36.124	16.706

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
47	025	1	2.795	-0.979	0.707	0.847	0.018	0.723	70.8	83.3	783.7	71.2	83.4
48	025	2	2.800	-0.841	0.701	0.858	0.066	0.732	43.9	93.1	790.1	44.6	93.7
49	025	3	2.797	-0.700	0.702	0.848	0.077	0.727	41.0	98.3	782.5	42.7	98.7
50	025	4	2.798	-0.559	0.702	0.855	0.148	0.744	12.5	123.6	791.4	13.5	123.8
51	025	5	2.798	-0.490	0.703	0.852	0.179	0.740	-6.8	127.8	786.8	11.9	128.8
52	025	6	2.798	-0.421	0.702	0.840	0.197	0.721	-28.3	123.0	783.0	31.4	154.5
53	025	7	2.801	-0.351	0.698	0.850	0.265	0.716	-81.3	120.2	782.9	81.7	120.8
54	025	8	2.795	-0.280	0.704	0.843	0.325	0.660	-171.3	75.5	750.8	171.7	76.6
55	025	9	2.799	-0.209	0.701	0.816	0.515	0.502	-437.1	-41.1	675.0	-437.1	-41.1
56	025	10	2.797	-0.141	0.704	0.883	0.665	0.265	-840.1	-331.5	606.2	-840.1	-331.5
57	025	11	2.799	-0.069	0.700	1.030	0.451	0.127	-987.8	-643.9	623.9	-987.8	-643.9
58	025	12	2.802	0.000	0.699	1.044	0.328	-0.039	-1127.4	-872.3	567.8	-1127.4	-872.3
59	025	13	2.800	0.072	0.700	1.046	0.251	-0.252	-1317.0	-1120.6	475.7	-1317.0	-1120.6
60	025	14	2.797	0.140	0.704	1.133	0.255	-0.329	-1474.6	-1274.8	489.7	-1474.6	-1274.8
61	025	15	2.798	0.210	0.700	1.271	-0.102	-0.015	-1039.6	-1112.6	700.0	-1039.6	-1112.6
62	025	16	2.799	0.279	0.700	1.293	-0.255	0.479	-425.2	-617.9	926.3	-425.2	-617.9
63	025	17	2.798	0.348	0.703	1.034	-0.375	0.825	251.2	-37.1	934.3	251.2	-37.1
64	025	18	2.798	0.418	0.703	0.891	-0.349	0.938	480.6	213.3	894.3	480.6	213.3
65	025	19	2.793	0.491	0.707	0.827	-0.347	0.851	440.7	173.2	828.2	440.7	173.2
66	025	20	2.795	0.560	0.704	0.854	-0.320	0.772	311.3	67.1	802.2	311.8	68.5
67	025	21	2.796	0.700	0.703	0.814	-0.210	0.757	269.9	107.1	783.8	270.0	107.3
68	025	22	2.799	0.841	0.699	0.827	-0.166	0.751	224.2	96.4	780.1	224.6	97.4
69	025	23	2.802	0.981	0.699	0.823	-0.133	0.731	187.7	84.5	774.1	188.1	84.8

Table 3. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
23	026	23	7	1	2	36.590	17.307

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	026	1	2.797	-0.979	0.801	0.820	0.041	0.711	67.6	97.8	767.1	68.3	98.3
2	026	2	2.799	-0.841	0.797	0.832	0.067	0.701	31.5	81.5	767.5	32.8	82.0
3	026	3	2.800	-0.700	0.799	0.840	0.101	0.714	19.6	95.6	778.4	20.5	96.0
4	026	4	2.797	-0.561	0.801	0.842	0.147	0.697	-28.5	83.4	771.4	30.7	83.8
5	026	5	2.796	-0.489	0.801	0.837	0.150	0.680	-44.7	68.9	756.3	47.1	69.8
6	026	6	2.798	-0.421	0.800	0.852	0.170	0.659	-91.5	37.2	756.8	91.8	40.3
7	026	7	2.801	-0.349	0.796	0.856	0.203	0.646	-129.4	25.3	756.1	131.6	33.1
8	026	8	2.802	-0.281	0.795	0.867	0.266	0.582	-245.4	-42.3	736.1	245.9	46.3
9	026	9	2.798	-0.210	0.798	0.901	0.301	0.478	-410.9	-180.5	708.0	411.1	180.8
10	026	10	2.798	-0.141	0.800	0.927	0.310	0.330	-603.3	-365.1	660.0	603.5	365.2
11	026	11	2.795	-0.071	0.801	0.948	0.333	0.196	-777.4	-521.8	610.0	-777.4	-521.8
12	026	12	2.797	0.000	0.800	0.992	0.253	0.084	-900.0	-704.0	589.8	-900.0	-704.0
13	026	13	2.800	0.069	0.796	1.067	0.029	-0.022	-957.8	-932.3	589.8	-957.8	-932.3
14	026	14	2.801	0.139	0.794	1.089	-0.166	-0.038	-874.1	-996.4	589.8	-874.1	-996.4
15	026	15	2.797	0.209	0.801	1.052	-0.442	0.105	-528.9	-864.2	633.9	-528.9	-864.2
16	026	16	2.798	0.281	0.798	1.016	-0.648	0.372	-82.0	-577.8	730.1	-82.0	-577.8
17	026	17	2.796	0.350	0.801	0.897	-0.530	0.518	113.5	-289.4	719.2	113.5	-289.4
18	026	18	2.798	0.421	0.798	0.883	-0.346	0.654	173.4	-93.1	777.1	173.4	-93.1
19	026	19	2.797	0.491	0.798	0.873	-0.380	0.681	230.2	-60.3	777.1	230.5	60.7
20	026	20	2.803	0.560	0.794	0.859	-0.356	0.685	232.6	-39.7	771.4	237.3	41.2
21	026	21	2.799	0.700	0.797	0.835	-0.223	0.704	197.1	26.3	764.5	197.3	30.4
22	026	22	2.798	0.840	0.797	0.803	-0.162	0.684	168.1	43.2	741.2	168.8	46.2
23	026	23	2.803	0.979	0.794	0.810	-0.135	0.699	164.5	59.4	754.3	164.8	60.2

NPT	RUN	IY	JZ	LUDIR		UT	P
46	026	23	8	1	2	36.312	17.045

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
24	026	1	2.804	-0.979	0.848	0.811	0.032	0.678	43.2	66.4	743.6	44.2	66.8
25	026	2	2.802	-0.840	0.849	0.826	0.043	0.687	34.1	66.1	757.8	36.3	66.5
26	026	3	2.802	-0.701	0.849	0.840	0.088	0.681	-10.2	55.8	760.6	15.5	56.4
27	026	4	2.804	-0.559	0.847	0.837	0.132	0.660	-55.7	44.7	754.3	56.4	45.2
28	026	5	2.801	-0.491	0.851	0.846	0.151	0.643	-93.4	20.8	743.7	93.7	22.5
29	026	6	2.801	-0.421	0.850	0.843	0.165	0.633	-110.1	15.8	745.1	110.3	17.7
30	026	7	2.802	-0.350	0.847	0.877	0.209	0.621	-176.8	-17.9	754.1	177.2	20.8
31	026	8	2.803	-0.281	0.850	0.864	0.231	0.554	-254.2	-77.6	722.0	255.0	78.0
32	026	9	2.803	-0.210	0.849	0.901	0.235	0.475	-376.1	-196.6	706.0	376.3	196.9
33	026	10	2.806	-0.141	0.848	0.924	0.210	0.364	-506.1	-343.9	674.0	506.4	344.1
34	026	11	2.802	-0.068	0.849	0.954	0.211	0.268	-638.6	-475.7	647.9	-638.6	-475.7
35	026	12	2.801	0.001	0.852	0.962	0.210	0.174	-748.4	-585.8	611.9	-748.4	-585.8
36	026	13	2.801	0.072	0.850	1.029	0.033	0.089	-798.2	-770.1	611.9	-798.2	-770.1
37	026	14	2.802	0.140	0.848	1.052	-0.154	0.090	-706.5	-820.2	621.9	-706.5	-820.2
38	026	15	2.805	0.210	0.846	1.028	-0.386	0.215	-417.2	-710.0	666.0	-417.2	-710.0
39	026	16	2.807	0.279	0.843	0.988	-0.520	0.374	-127.9	-521.8	708.0	-127.9	-521.8
40	026	17	2.806	0.351	0.844	0.937	-0.441	0.519	29.7	-305.4	742.1	29.7	-305.4
41	026	18	2.801	0.421	0.852	0.904	-0.378	0.600	113.5	-177.3	766.1	113.5	-177.3
42	026	19	2.802	0.490	0.848	0.874	-0.346	0.643	167.4	-97.1	765.0	167.4	-97.1

Table 3. Concluded

43	026	20	2.807	0.558	0.843	0.840	-0.293	0.668	195.3	-31.0	765.0	195.3	-31.0
44	026	21	2.802	0.699	0.849	0.839	-0.215	0.697	181.4	17.0	763.2	181.4	17.0
45	026	22	2.802	0.840	0.847	0.823	-0.164	0.696	164.8	39.1	752.6	165.0	39.5
46	026	23	2.803	0.982	0.849	0.815	-0.141	0.683	145.0	35.9	748.8	145.8	37.1

NPT	RUN	IY	JZ	LVDIR		UT	P
69	026	23	9	1	2	10.063	1.3091

IPT	RUN	I	X	Y	Z	U	V	W	WB1	WG1	WG2	RMSB	RMSG
47	026	1	2.801	-0.980	0.952	0.835	0.047	0.685	22.6	57.3	760.0	24.2	57.6
48	026	2	2.802	-0.839	0.950	0.842	0.052	0.672	-1.5	37.3	758.3	6.0	37.9
49	026	3	2.800	-0.700	0.950	0.843	0.073	0.667	-19.8	34.8	757.6	24.4	35.3
50	026	4	2.798	-0.558	0.953	0.856	0.109	0.645	-76.0	6.3	753.7	76.7	16.6
51	026	5	2.798	-0.489	0.952	0.851	0.125	0.626	-101.5	-6.9	743.3	101.8	10.2
52	026	6	2.800	-0.421	0.954	0.851	0.136	0.605	-130.4	-28.1	728.9	130.6	29.0
53	026	7	2.801	-0.351	0.949	0.866	0.138	0.583	-171.1	-65.5	738.1	172.3	67.7
54	026	8	2.802	-0.281	0.951	0.887	0.151	0.538	-244.9	-129.8	724.0	245.0	129.9
55	026	9	2.800	-0.210	0.953	0.894	0.156	0.478	-318.8	-200.6	698.0	319.2	201.0
56	026	10	2.805	-0.139	0.946	0.902	0.144	0.427	-377.4	-266.7	686.0	377.5	266.9
57	026	11	2.806	-0.071	0.945	0.916	0.136	0.373	-447.1	-341.5	674.0	-447.1	-341.5
58	026	12	2.804	-0.001	0.944	0.926	0.089	0.301	-508.9	-439.6	647.9	-508.9	-439.6
59	026	13	2.808	0.070	0.942	0.965	-0.021	0.288	-491.0	-505.7	662.0	-491.0	-505.7
60	026	14	2.799	0.138	0.952	0.964	-0.116	0.296	-425.2	-511.7	662.0	-425.2	-511.7
61	026	15	2.803	0.211	0.950	0.956	-0.257	0.341	-288.1	-481.8	676.0	288.2	481.9
62	026	16	2.799	0.279	0.952	0.942	-0.287	0.412	-181.0	-400.2	704.0	181.2	400.3
63	026	17	2.804	0.348	0.949	0.917	-0.314	0.476	-73.4	-314.1	718.9	74.4	314.3
64	026	18	2.801	0.419	0.948	0.912	-0.289	0.535	-17.4	-236.8	734.6	21.7	236.9
65	026	19	2.799	0.488	0.953	0.882	-0.270	0.573	38.5	-168.9	742.7	38.9	169.1
66	026	20	2.801	0.560	0.952	0.870	-0.267	0.615	94.7	-108.6	745.6	96.2	109.1
67	026	21	2.799	0.701	0.953	0.845	-0.201	0.640	105.5	-49.4	748.3	106.6	50.4
68	026	22	2.800	0.839	0.951	0.803	-0.169	0.662	147.9	18.1	731.8	148.1	20.0
69	026	23	2.800	0.981	0.952	0.818	-0.129	0.660	109.3	10.0	735.8	109.6	13.6

STOP --

Table 4. Vorticities and Circulations for 37.5° Pitch Angle and X = 2.8

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	1	-0.910	0.527	0.007831	-0.000393	-0.0501
2	1	-0.770	0.527	0.007768	0.002440	0.3141
3	1	-0.630	0.527	0.007845	-0.000633	-0.0807
4	1	-0.525	0.526	0.003831	0.001051	0.2742
5	1	-0.455	0.525	0.003563	0.000966	0.2713
6	1	-0.385	0.528	0.003247	0.003676	1.1321

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	2	-0.910	0.578	0.006425	-0.002656	-0.4134
2	2	-0.770	0.577	0.006375	-0.000025	-0.0040
3	2	-0.630	0.576	0.005859	-0.003917	-0.6686
4	2	-0.525	0.575	0.002987	-0.001142	-0.3824
5	2	-0.455	0.576	0.003455	-0.002121	-0.6140
6	2	-0.385	0.578	0.003781	-0.001415	-0.3744
7	2	-0.314	0.577	0.003716	-0.004793	-1.2898
8	2	-0.245	0.576	0.003759	-0.013860	-3.6877
9	2	-0.175	0.573	0.003585	-0.016049	-4.4768
10	2	-0.105	0.573	0.003213	-0.010870	-3.3828
11	2	-0.035	0.572	0.002993	-0.005169	-1.7269
12	2	0.036	0.571	0.003287	-0.000757	-0.2303
13	2	0.106	0.572	0.003602	0.000290	0.0806
14	2	0.175	0.574	0.003174	0.012789	4.0289
15	2	0.244	0.576	0.002980	0.025817	8.6638
16	2	0.315	0.578	0.003400	0.027576	8.1096

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	3	-0.910	0.626	0.006995	0.003019	0.4316
2	3	-0.770	0.625	0.006946	0.002905	0.4182
3	3	-0.630	0.623	0.007180	0.003188	0.4440
4	3	-0.526	0.623	0.003743	0.001992	0.5322
5	3	-0.455	0.625	0.003575	0.004587	1.2832
6	3	-0.384	0.627	0.003237	0.002672	0.8256
7	3	-0.314	0.628	0.003308	-0.002807	-0.8487
8	3	-0.244	0.627	0.003479	-0.010533	-3.0277
9	3	-0.174	0.625	0.003671	-0.025971	-7.0748
10	3	-0.104	0.623	0.003802	-0.021487	-5.6510
11	3	-0.034	0.622	0.004020	-0.008902	-2.2144
12	3	0.036	0.622	0.003962	-0.008467	-2.1368
13	3	0.105	0.624	0.003500	0.004092	1.1693
14	3	0.175	0.623	0.003625	0.012186	3.3619
15	3	0.244	0.623	0.003564	0.022221	6.2356
16	3	0.315	0.626	0.003429	0.011825	3.4486
17	3	0.385	0.626	0.003551	-0.003172	-0.8932
18	3	0.455	0.625	0.003929	-0.002322	-0.5910
19	3	0.525	0.623	0.003894	-0.001496	-0.3842

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	4	-0.910	0.678	0.007327	-0.001101	-0.1503
2	4	-0.770	0.675	0.007351	-0.000720	-0.0980
3	4	-0.630	0.675	0.007491	-0.000337	-0.0450
4	4	-0.525	0.676	0.003652	-0.001406	-0.3848
5	4	-0.455	0.677	0.003686	-0.000921	-0.2500
6	4	-0.385	0.675	0.003476	-0.000698	-0.2008
7	4	-0.315	0.676	0.003456	-0.002338	-0.6764
8	4	-0.245	0.677	0.003551	-0.006527	-1.8380
9	4	-0.175	0.677	0.003554	-0.010993	-3.0928
10	4	-0.104	0.676	0.003704	-0.006462	-1.7448
11	4	-0.034	0.675	0.003344	0.000364	0.1087
12	4	0.035	0.675	0.003422	-0.000603	-0.1762
13	4	0.105	0.675	0.003677	-0.002233	-0.6074
14	4	0.175	0.675	0.003738	0.012394	3.3154
15	4	0.245	0.674	0.003544	0.029459	8.3126
16	4	0.314	0.676	0.003613	0.022951	6.3525
17	4	0.384	0.678	0.003531	0.011525	3.2642
18	4	0.455	0.679	0.003752	0.001376	0.3668
19	4	0.525	0.678	0.003862	-0.002414	-0.6252
20	4	0.630	0.676	0.007634	0.000020	0.0026
21	4	0.770	0.676	0.006941	0.001083	0.1560
22	4	0.910	0.678	0.005618	0.001397	0.2487

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	5	-0.909	0.730	0.007132	0.000602	0.0844
2	5	-0.770	0.727	0.007223	-0.000244	-0.0337
3	5	-0.630	0.727	0.007017	0.000370	0.0527
4	5	-0.525	0.728	0.003528	0.000781	0.2214
5	5	-0.455	0.728	0.003499	-0.000110	-0.0315
6	5	-0.386	0.727	0.003777	-0.000934	-0.2472
7	5	-0.315	0.727	0.003678	-0.000996	-0.2708
8	5	-0.245	0.726	0.003378	-0.003219	-0.9528
9	5	-0.175	0.727	0.003388	-0.000567	-0.1673
10	5	-0.106	0.729	0.003819	0.001513	0.3961
11	5	-0.035	0.728	0.003923	-0.003858	-0.9834
12	5	0.035	0.726	0.003857	-0.004708	-1.2209
13	5	0.106	0.727	0.003520	0.005546	1.5755
14	5	0.175	0.728	0.003599	0.014534	4.0381
15	5	0.245	0.727	0.003698	0.017165	4.6417
16	5	0.314	0.727	0.003602	0.015917	4.4190
17	5	0.385	0.727	0.003439	0.011397	3.3140
18	5	0.455	0.727	0.003088	0.004426	1.4332
19	5	0.525	0.727	0.003012	0.000472	0.1568
20	5	0.630	0.729	0.006988	0.002698	0.3862
21	5	0.770	0.727	0.007383	0.001032	0.1398
22	5	0.911	0.725	0.007429	-0.000448	-0.0603

Table 4. Concluded

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	6	-0.910	0.777	0.006061	-0.001117	-0.1843
2	6	-0.770	0.776	0.006267	-0.000756	-0.1206
3	6	-0.630	0.776	0.006674	-0.001314	-0.1969
4	6	-0.525	0.777	0.003400	-0.000635	-0.1868
5	6	-0.455	0.777	0.003203	0.000470	0.1469
6	6	-0.385	0.776	0.003140	0.000724	0.2305
7	6	-0.315	0.774	0.003013	0.001049	0.3481
8	6	-0.245	0.774	0.003266	0.001659	0.5082
9	6	-0.175	0.776	0.003241	0.000503	0.1553
10	6	-0.105	0.778	0.003239	0.000021	0.0064
11	6	-0.035	0.778	0.003122	0.000664	0.2128
12	6	0.035	0.776	0.003092	0.001119	0.3620
13	6	0.104	0.774	0.003005	0.003246	1.0800
14	6	0.174	0.776	0.003087	0.012039	3.9003
15	6	0.245	0.777	0.003279	0.018655	5.6887
16	6	0.315	0.776	0.003273	0.006489	1.9824
17	6	0.385	0.776	0.003376	-0.003193	-0.9459
18	6	0.456	0.773	0.003441	-0.003777	-1.0977
19	6	0.525	0.773	0.003280	-0.001268	-0.3865
20	6	0.630	0.775	0.005935	-0.001685	-0.2840
21	6	0.771	0.775	0.006099	-0.001660	-0.2722
22	6	0.910	0.774	0.006069	0.000264	0.0435

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	7	-0.910	0.823	0.006904	0.001173	0.1700
2	7	-0.770	0.823	0.007111	0.001444	0.2031
3	7	-0.630	0.824	0.006712	0.000579	0.0863
4	7	-0.525	0.825	0.003349	-0.000130	-0.0387
5	7	-0.456	0.825	0.003433	-0.000345	-0.1005
6	7	-0.385	0.823	0.003626	-0.000412	-0.1137
7	7	-0.315	0.822	0.003621	-0.001273	-0.3517
8	7	-0.245	0.823	0.003709	-0.000634	-0.1710
9	7	-0.176	0.824	0.003368	-0.000352	-0.1046
10	7	-0.105	0.825	0.003424	0.001281	0.3742
11	7	-0.035	0.825	0.003490	0.000269	0.0770
12	7	0.035	0.825	0.003707	-0.002016	-0.5438
13	7	0.105	0.822	0.003729	-0.000558	-0.1497
14	7	0.174	0.822	0.003471	0.001940	0.5590
15	7	0.245	0.822	0.003131	0.001730	0.5527
16	7	0.315	0.822	0.003103	-0.000726	-0.2339
17	7	0.385	0.824	0.003421	0.001810	0.5291
18	7	0.456	0.824	0.003595	0.000855	0.2378
19	7	0.525	0.821	0.003365	-0.001452	-0.4311
20	7	0.629	0.821	0.007099	-0.002054	-0.2894
21	7	0.770	0.822	0.007187	-0.000533	-0.0742
22	7	0.910	0.822	0.007396	0.000326	0.0440

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	8	-0.910	0.900	0.014370	-0.000970	-0.0675
2	8	-0.770	0.900	0.014142	-0.000058	-0.0041
3	8	-0.629	0.900	0.014727	0.000294	0.0200
4	8	-0.524	0.901	0.007073	-0.000059	-0.0083
5	8	-0.455	0.902	0.007068	0.000197	0.0279
6	8	-0.385	0.900	0.007246	0.000864	0.1192
7	8	-0.316	0.899	0.007113	-0.000183	-0.0257
8	8	-0.245	0.901	0.007266	-0.000813	-0.1119
9	8	-0.175	0.899	0.007016	-0.001547	-0.2205
10	8	-0.105	0.897	0.006857	-0.001208	-0.1762
11	8	-0.035	0.897	0.006567	-0.000567	-0.0864
12	8	0.035	0.897	0.006497	0.001174	0.1807
13	8	0.105	0.898	0.006684	0.000211	0.0316
14	8	0.175	0.899	0.007424	0.001717	0.2313
15	8	0.245	0.898	0.007360	-0.000066	-0.0090
16	8	0.315	0.897	0.007570	-0.000849	-0.1121
17	8	0.385	0.899	0.007062	-0.000225	-0.0319
18	8	0.455	0.900	0.006975	-0.000916	-0.1313
19	8	0.524	0.899	0.007461	-0.000075	-0.0100
20	8	0.629	0.899	0.015020	0.000187	0.0125
21	8	0.770	0.900	0.014542	0.000210	0.0144
22	8	0.910	0.900	0.014651	-0.000665	-0.0454

STOP --

Table 5. Flow Field Velocities at 37.5° Pitch Angle and X = 4.9

NPT	RUN	IY	JZ	LUDIR	UT	P
144	028	5	1	1 2	13.804	2.4345

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
127	028	1	4.896	-0.839	0.455	0.796	0.092	0.864	229.2	297.4	816.2	229.2	297.4
128	028	2	4.899	-0.559	0.451	0.780	0.174	0.965	307.5	437.6	848.2	307.5	437.6
129	028	3	4.897	-0.420	0.453	0.690	0.134	0.852	279.9	379.5	746.1	279.9	379.5
130	028	4	4.901	-0.348	0.451	0.964	-0.186	0.227	-459.1	-597.9	627.9	-459.1	-597.9
131	028	5	4.905	-0.281	0.442	0.321	-0.113	-0.404	-658.6	-742.1	5.1	-658.6	-742.1

NPT	RUN	IY	JZ	LUDIR	UT	P
162	028	9	2	1 2	36.600	17.115

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
145	028	1	4.896	-0.841	0.526	0.709	0.118	0.802	219.3	307.4	806.2	219.3	307.4
146	028	2	4.902	-0.560	0.525	0.758	0.172	0.944	305.0	433.6	828.2	305.0	433.6
147	028	3	4.901	-0.419	0.522	0.711	0.344	0.980	285.1	543.8	814.2	285.1	543.8
148	028	4	4.898	-0.281	0.524	0.960	0.309	0.339	-618.7	-381.5	680.0	-618.7	-381.5
149	028	5	4.906	-0.210	0.520	1.210	-0.243	0.144	-738.4	-922.3	742.1	-738.4	-922.3
150	028	6	4.903	-0.140	0.519	1.163	-0.341	0.069	-728.4	-988.4	686.0	-728.4	-988.4
151	028	7	4.902	-0.071	0.523	1.199	-0.336	-0.043	-872.1	-1122.6	645.9	-872.1	-1122.6
152	028	8	4.899	-0.000	0.524	1.266	-0.597	-0.082	-828.2	-1278.8	670.0	-828.2	-1278.8
153	028	9	4.902	0.072	0.527	1.256	-0.357	0.020	-846.1	-1114.6	710.0	-846.1	-1114.6

NPT	RUN	IY	JZ	LUDIR	UT	P
180	028	15	3	1 2	36.375	16.905

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
163	028	1	4.895	-0.841	0.607	0.794	0.078	0.832	203.3	261.4	802.2	203.3	261.4
164	028	2	4.896	-0.559	0.605	0.774	0.213	0.912	227.2	391.6	822.2	227.2	391.6
165	028	3	4.897	-0.421	0.606	0.748	0.360	0.943	205.3	479.7	828.2	205.3	479.7
166	028	4	4.897	-0.281	0.598	0.923	0.166	0.619	-195.7	-69.1	782.1	-195.7	-69.1
167	028	5	4.902	-0.209	0.597	1.021	0.075	0.480	-381.3	-323.5	776.1	-381.3	-323.5
168	028	6	4.900	-0.139	0.598	1.106	0.026	0.339	-572.8	-551.8	750.1	-572.8	-551.8
169	028	7	4.896	-0.069	0.605	1.178	-0.140	0.189	-710.5	-814.2	734.1	-710.5	-814.2
170	028	8	4.899	0.001	0.601	1.136	-0.117	0.014	-876.0	-960.4	631.9	-876.0	-960.4
171	028	9	4.901	0.072	0.604	1.145	-0.193	-0.024	-898.0	-1042.5	631.9	-898.0	-1042.5
172	028	10	4.906	0.139	0.596	1.095	-0.067	-0.135	-1055.6	-1102.6	557.8	-1055.6	-1102.6
173	028	11	4.901	0.210	0.603	1.051	-0.170	-0.159	-983.8	-1110.6	521.8	-983.8	-1110.6
174	028	12	4.898	0.279	0.604	1.028	0.213	-0.161	-1181.3	-1014.5	505.7	-1181.3	-1014.5
175	028	13	4.906	0.349	0.593	0.993	0.215	-0.089	-1065.6	-898.3	513.7	-1065.6	-898.3
176	028	14	4.902	0.419	0.599	0.876	0.318	0.104	-818.2	-571.8	535.8	-818.2	-571.8
177	028	15	4.898	0.489	0.607	0.837	-0.041	0.265	-397.2	-427.6	581.8	-397.2	-427.6

Table 5. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
108	028	17	4	1	2	36.171	16.715

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
91	028	1	4.898	-0.839	0.677	0.791	0.110	0.804	155.4	237.3	783.3	155.4	237.3
92	028	2	4.903	-0.560	0.674	0.744	0.180	0.847	205.3	341.5	784.8	205.3	341.5
93	028	3	4.901	-0.419	0.676	0.746	0.250	0.881	199.3	387.6	792.1	199.3	387.6
94	028	4	4.904	-0.281	0.669	0.898	0.006	0.716	25.7	29.0	794.1	25.7	29.0
95	028	5	4.905	-0.211	0.667	1.028	0.169	0.505	-413.2	-283.4	790.1	-413.2	-283.4
96	028	6	4.908	-0.141	0.663	1.113	0.117	0.395	-578.8	-487.7	760.1	-578.8	-487.7
97	028	7	4.901	-0.069	0.676	1.069	-0.694	0.245	-239.6	-762.1	694.0	-239.6	-762.1
98	028	8	4.903	0.000	0.673	1.090	-0.064	-0.077	-977.8	-1022.5	573.8	-977.8	-1022.5
99	028	9	4.900	0.071	0.678	1.231	-0.066	-0.186	-1217.2	-1262.8	605.9	-1217.2	-1262.8
100	028	10	4.899	0.139	0.678	0.987	0.510	-0.196	-1356.9	-962.4	467.7	-1356.9	-962.4
101	028	11	4.906	0.210	0.671	1.036	0.398	-0.286	-1426.7	-1118.6	453.7	-1426.7	-1118.6
102	028	12	4.901	0.281	0.676	0.977	0.299	-0.196	-1225.2	-992.4	461.7	-1225.2	-992.4
103	028	13	4.899	0.349	0.677	0.982	0.194	-0.066	-1019.7	-868.3	517.7	-1019.7	-868.3
104	028	14	4.903	0.419	0.672	0.918	-0.049	0.123	-626.7	-662.0	571.8	-626.7	-662.0
105	028	15	4.905	0.490	0.671	0.812	-0.014	0.339	-307.4	-317.5	595.9	-307.4	-317.5
106	028	16	4.906	0.562	0.672	0.882	0.077	0.519	-219.7	-161.2	714.0	-219.7	-161.2
107	028	17	4.899	0.700	0.677	0.785	-0.072	0.773	229.2	173.2	764.1	229.2	173.2

NPT	RUN	IY	JZ	LVDIR		UT	P
90	028	18	5	1	2	36.268	16.806

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
73	028	1	4.900	-0.839	0.753	0.808	0.139	0.767	83.3	187.2	775.6	83.7	187.3
74	028	2	4.902	-0.561	0.750	0.793	0.185	0.812	118.8	257.4	784.3	119.5	257.5
75	028	3	4.903	-0.419	0.749	0.784	0.274	0.809	72.6	280.1	783.9	73.5	280.3
76	028	4	4.896	-0.282	0.756	0.755	0.398	0.776	-10.2	293.4	758.1	-10.2	293.4
77	028	5	4.899	-0.210	0.756	0.821	0.454	0.801	-70.0	273.4	798.1	-70.0	273.4
78	028	6	4.905	-0.141	0.746	0.905	0.414	0.620	-321.4	-5.0	772.1	-321.4	-5.0
79	028	7	4.904	-0.071	0.747	0.883	0.522	0.539	-451.1	-55.1	720.0	-451.1	-55.1
80	028	8	4.900	0.001	0.751	1.007	0.271	0.194	-796.2	-587.8	641.9	-796.2	-587.8
81	028	9	4.903	0.070	0.750	0.966	0.525	-0.128	-1263.1	-860.2	481.7	-1263.1	-860.2
82	028	10	4.897	0.141	0.756	0.969	0.324	-0.217	-1249.1	-998.4	445.6	-1249.1	-998.4
83	028	11	4.900	0.209	0.753	0.965	0.527	-0.284	-1438.7	-1032.5	415.6	-1438.7	-1032.5
84	028	12	4.903	0.279	0.749	0.934	0.635	-0.195	-1366.8	-882.3	433.6	-1366.8	-882.3
85	028	13	4.906	0.349	0.746	0.861	0.380	-0.017	-961.8	-672.0	467.7	-961.8	-672.0
86	028	14	4.904	0.420	0.751	0.786	0.455	0.188	-718.4	-371.5	515.7	-718.4	-371.5
87	028	15	4.904	0.492	0.747	0.781	0.442	0.395	-479.0	-143.2	601.9	-479.0	-143.2
88	028	16	4.904	0.560	0.748	0.752	0.139	0.590	-66.0	39.1	670.0	-66.0	39.1
89	028	17	4.903	0.699	0.751	0.662	0.064	0.784	271.1	317.5	706.0	271.1	317.5
90	028	18	4.904	0.839	0.747	0.722	-0.055	0.805	309.0	265.4	744.1	309.0	265.4

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Table 5. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
72	028	18	6	1	2	36.381	16.910

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
55	028	1	4.897	-0.839	0.828	0.805	0.107	0.762	97.5	176.8	767.2	97.8	176.9
56	028	2	4.903	-0.560	0.818	0.800	0.164	0.786	96.7	220.2	782.2	97.9	220.6
57	028	3	4.900	-0.422	0.825	0.776	0.130	0.817	171.8	268.3	778.9	173.7	268.5
58	028	4	4.902	-0.280	0.822	0.745	0.407	0.785	3.8	311.4	749.7	3.8	311.4
59	028	5	4.898	-0.211	0.826	0.791	0.428	0.699	-143.8	183.3	744.1	-143.8	183.3
60	028	6	4.900	-0.140	0.825	0.955	0.513	0.495	-560.8	-167.2	748.1	-560.8	-167.2
61	028	7	4.900	-0.067	0.824	0.975	0.399	0.219	-822.2	-513.7	641.9	-822.2	-513.7
62	028	8	4.907	0.000	0.819	0.946	0.592	-0.029	-1181.3	-726.0	515.7	-1181.3	-726.0
63	028	9	4.901	0.070	0.826	0.944	0.554	-0.238	-1392.8	-964.4	425.6	-1392.8	-964.4
64	028	10	4.905	0.141	0.816	0.956	0.512	-0.285	-1428.7	-1032.5	411.6	-1428.7	-1032.5
65	028	11	4.900	0.209	0.824	0.915	0.456	-0.264	-1336.9	-984.4	397.6	-1336.9	-984.4
66	028	12	4.898	0.280	0.829	0.878	0.608	-0.056	-1165.3	-696.0	467.7	-1165.3	-696.0
67	028	13	4.903	0.350	0.819	0.964	0.415	0.374	-646.6	-327.5	700.0	-646.6	-327.5
68	028	14	4.898	0.420	0.828	0.853	0.122	0.525	-213.7	-121.2	698.0	-213.7	-121.2
69	028	15	4.899	0.491	0.826	0.878	0.111	0.548	-203.7	-119.2	722.0	-203.7	-119.2
70	028	16	4.899	0.560	0.829	0.790	-0.119	0.817	299.1	207.3	782.1	299.1	207.3
71	028	17	4.898	0.701	0.826	0.786	-0.075	0.777	233.2	175.3	760.1	233.2	175.3
72	028	18	4.899	0.840	0.825	0.759	-0.005	0.788	231.2	225.3	760.1	231.2	225.3

NPT	RUN	IY	JZ	LVDIR		UT	P
54	028	18	7	1	2	36.215	16.756

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
37	028	1	4.897	-0.841	0.904	0.794	0.096	0.723	71.2	142.9	751.6	71.8	143.3
38	028	2	4.903	-0.560	0.900	0.790	0.174	0.726	33.4	165.9	757.6	35.7	166.2
39	028	3	4.907	-0.419	0.888	0.730	0.204	0.741	83.6	237.3	722.2	83.6	237.3
40	028	4	4.898	-0.280	0.904	0.746	0.393	0.759	-18.2	279.4	740.1	-18.2	279.4
41	028	5	4.902	-0.209	0.901	0.711	0.450	0.713	-72.0	269.4	702.0	-72.0	269.4
42	028	6	4.905	-0.139	0.893	0.756	0.474	0.621	-225.6	133.2	684.0	-225.6	133.2
43	028	7	4.897	-0.071	0.908	0.750	0.547	0.386	-524.9	-107.2	583.8	-524.9	-107.2
44	028	8	4.902	-0.000	0.901	0.882	0.817	0.166	-1031.7	-409.6	559.8	-1031.7	-409.6
45	028	9	4.896	0.072	0.908	0.869	0.708	-0.028	-1183.3	-637.9	473.7	-1183.3	-637.9
46	028	10	4.901	0.140	0.898	0.948	0.562	-0.180	-1324.9	-894.3	449.6	-1324.9	-894.3
47	028	11	4.904	0.211	0.898	0.918	0.540	-0.140	-1253.1	-836.2	453.7	-1253.1	-836.2
48	028	12	4.906	0.282	0.894	0.777	0.487	0.014	-931.9	-555.8	441.6	-931.9	-555.8
49	028	13	4.900	0.351	0.904	0.772	0.168	0.283	-443.1	-313.5	553.8	-443.1	-313.5
50	028	14	4.901	0.421	0.901	0.670	0.123	0.450	-143.8	-49.1	571.8	-143.8	-49.1
51	028	15	4.895	0.493	0.908	0.752	0.051	0.677	81.6	119.2	708.0	81.6	119.2
52	028	16	4.901	0.559	0.902	0.689	-0.091	0.771	321.0	249.4	714.0	321.0	249.4
53	028	17	4.905	0.699	0.898	0.754	-0.139	0.798	323.0	215.3	760.1	323.0	215.3
54	028	18	4.908	0.841	0.893	0.763	-0.110	0.775	273.1	187.3	756.1	273.1	187.3

Table 5. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
36	028	18	8	1	2	35.981	16.540

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
19	028	1	4.910	-0.839	1.046	0.791	0.076	0.693	52.5	109.1	737.6	56.2	109.6
20	028	2	4.906	-0.560	1.053	0.754	0.280	0.707	-18.2	191.3	714.8	-18.2	191.3
21	028	3	4.904	-0.419	1.056	0.797	0.303	0.671	-107.9	121.2	728.0	-107.9	121.2
22	028	4	4.906	-0.282	1.051	0.790	0.451	0.596	-267.5	73.1	690.0	-267.5	73.1
23	028	5	4.909	-0.208	1.047	0.788	0.447	0.526	-341.4	-3.0	660.0	-341.4	-3.0
24	028	6	4.912	-0.139	1.045	0.819	0.499	0.449	-479.0	-103.1	639.9	-479.0	-103.1
25	028	7	4.909	-0.070	1.046	0.843	0.540	0.315	-668.6	-261.4	595.9	-668.6	-261.4
26	028	8	4.918	-0.002	1.035	0.869	0.586	0.180	-868.1	-423.6	555.8	-868.1	-423.6
27	028	9	4.909	0.069	1.053	0.869	0.515	0.052	-961.8	-573.8	497.7	-961.8	-573.8
28	028	10	4.907	0.138	1.054	0.894	0.483	-0.018	-1049.6	-682.0	485.7	-1049.6	-682.0
29	028	11	4.905	0.208	1.054	0.884	0.288	-0.008	-917.9	-698.0	483.7	-917.9	-698.0
30	028	12	4.914	0.280	1.045	0.823	0.315	0.069	-798.2	-557.8	483.7	-798.2	-557.8
31	028	13	4.908	0.350	1.051	0.791	0.091	0.308	-383.3	-313.5	569.8	-383.3	-313.5
32	028	14	4.911	0.421	1.046	0.773	0.137	0.564	-109.9	-7.0	664.0	-109.9	-7.0
33	028	15	4.905	0.490	1.055	0.708	-0.071	0.715	231.2	175.3	700.0	231.2	175.3
34	028	16	4.905	0.559	1.056	0.724	-0.098	0.816	339.0	263.4	740.1	339.0	263.4
35	028	17	4.914	0.700	1.047	0.732	-0.234	0.828	426.8	247.4	758.1	426.8	247.4
36	028	18	4.912	0.841	1.044	0.761	-0.123	0.769	271.1	177.3	742.1	271.1	177.3

NPT	RUN	IY	JZ	LVDIR		UT	P
18	028	18	9	1	2	35.790	16.365

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	028	1	4.897	-0.840	1.206	0.793	0.127	0.681	6.9	102.3	728.3	17.1	102.7
2	028	2	4.899	-0.561	1.204	0.795	0.194	0.631	-87.9	58.6	710.7	88.5	59.9
3	028	3	4.900	-0.420	1.200	0.805	0.253	0.590	-174.1	16.7	696.3	174.7	22.0
4	028	4	4.903	-0.282	1.200	0.806	0.356	0.505	-328.0	-59.1	659.7	-328.0	-59.1
5	028	5	4.897	-0.210	1.206	0.827	0.373	0.472	-393.9	-109.2	662.6	-393.9	-109.2
6	028	6	4.899	-0.135	1.205	0.836	0.394	0.390	-502.0	-203.3	627.9	-502.0	-203.3
7	028	7	4.903	-0.070	1.199	0.878	0.440	0.328	-631.5	-297.4	623.9	-631.5	-297.4
8	028	8	4.903	0.000	1.137	0.878	0.418	0.246	-713.5	-393.6	593.9	-713.5	-393.6
9	028	9	4.903	0.070	1.196	0.919	0.471	0.154	-870.1	-513.7	569.8	-870.1	-513.7
10	028	10	4.898	0.138	1.206	0.916	0.432	0.125	-886.0	-555.8	561.8	-886.0	-555.8
11	028	11	4.898	0.212	1.206	0.872	0.448	0.073	-919.9	-575.8	517.7	-919.9	-575.8
12	028	12	4.898	0.278	1.206	0.834	0.355	0.197	-692.5	-421.6	545.8	-692.5	-421.6
13	028	13	4.898	0.352	1.206	0.871	0.204	0.397	-417.2	-261.4	651.9	-417.2	-261.4
14	028	14	4.904	0.420	1.137	0.764	-0.108	0.570	43.7	-39.1	666.0	43.7	-39.1
15	028	15	4.898	0.490	1.203	0.758	0.158	0.734	77.6	195.3	730.1	77.6	195.3
16	028	16	4.898	0.561	1.205	0.683	-0.117	0.813	386.8	295.4	726.0	386.8	295.4
17	028	17	4.903	0.700	1.200	0.724	-0.282	0.817	448.7	233.3	748.1	448.7	233.3
18	028	18	4.898	0.842	1.206	0.741	-0.082	0.790	291.1	227.3	746.1	291.1	227.3

Table 5. Concluded

NPT	RUN	IY	JZ	LVDIR		UT	P
126	028	18	10	1	2	36.290	16.826

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
109	028	1	4.894	-0.840	1.355	0.836	0.128	0.651	-63.6	33.0	744.1	-63.6	33.0
110	028	2	4.898	-0.560	1.354	0.854	0.190	0.610	-157.9	-15.0	728.0	-157.9	-15.0
111	028	3	4.898	-0.420	1.353	0.862	0.190	0.542	-241.6	-97.1	712.0	-241.6	-97.1
112	028	4	4.901	-0.280	1.352	0.872	0.236	0.471	-355.3	-175.3	688.0	-355.3	-175.3
113	028	5	4.896	-0.210	1.353	0.905	0.240	0.422	-441.0	-257.4	686.0	-441.0	-257.4
114	028	6	4.894	-0.139	1.360	0.906	0.251	0.365	-511.6	-319.5	662.0	-511.6	-319.5
115	028	7	4.897	-0.068	1.355	0.919	0.263	0.312	-589.7	-387.6	647.9	-589.7	-387.6
116	028	8	4.897	-0.001	1.353	0.943	0.296	0.263	-683.9	-455.7	639.9	-683.9	-455.7
117	028	9	4.900	0.070	1.353	0.998	0.111	0.182	-712.4	-625.9	633.9	-712.4	-625.9
118	028	10	4.897	0.141	1.352	1.030	0.117	0.113	-820.2	-728.0	621.9	-820.2	-728.0
119	028	11	4.901	0.209	1.350	0.958	0.128	0.152	-710.5	-611.9	589.8	-710.5	-611.9
120	028	12	4.894	0.279	1.360	0.954	-0.011	0.240	-540.9	-547.8	635.9	-540.9	-547.8
121	028	13	4.894	0.351	1.356	0.943	-0.178	0.338	-325.4	-459.7	668.0	-325.4	-459.7
122	028	14	4.894	0.419	1.356	0.911	-0.287	0.520	-34.1	-251.4	726.0	-34.1	-251.4
123	028	15	4.896	0.489	1.357	0.796	-0.432	0.690	337.0	5.1	742.1	337.0	5.1
124	028	16	4.904	0.560	1.347	0.789	-0.389	0.744	378.9	79.1	762.1	378.9	79.1
125	028	17	4.892	0.698	1.359	0.729	-0.242	0.847	454.7	269.4	762.1	454.7	269.4
126	028	18	4.894	0.840	1.356	0.743	-0.154	0.813	358.9	239.3	762.1	358.9	239.3

NPT	RUN	IY	JZ	LVDIR		UT	P
17	027	17	11	1	2	36.228	16.966

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	027	1	4.897	-1.121	1.508	0.813	0.060	0.649	-6.5	38.3	731.7	9.3	38.5
2	027	2	4.900	-0.981	1.502	0.798	0.083	0.639	-18.2	44.5	725.5	22.3	45.7
3	027	3	4.903	-0.841	1.495	0.820	0.090	0.622	-60.1	7.7	719.4	60.6	10.5
4	027	4	4.902	-0.700	1.498	0.824	0.111	0.614	-84.3	-0.2	725.5	85.0	7.0
5	027	5	4.903	-0.560	1.500	0.808	0.127	0.568	-131.2	-33.9	697.5	131.6	36.5
6	027	6	4.899	-0.420	1.504	0.830	0.133	0.524	-200.9	-99.7	685.2	201.1	100.2
7	027	7	4.898	-0.281	1.506	0.861	0.143	0.478	-284.8	-175.6	683.1	285.0	175.7
8	027	8	4.902	-0.140	1.500	0.888	0.080	0.402	-357.1	-295.4	668.6	357.2	295.5
9	027	9	4.901	0.002	1.498	0.871	0.078	0.269	-487.9	-427.6	599.6	-487.9	-427.6
10	027	10	4.904	0.141	1.499	0.955	-0.042	0.299	-459.1	-489.7	662.0	-459.1	-489.7
11	027	11	4.910	0.279	1.490	0.824	-0.106	0.426	-169.8	-251.4	647.9	-169.8	-251.4
12	027	12	4.909	0.420	1.489	0.818	-0.311	0.596	143.4	-95.1	712.0	143.4	-95.1
13	027	13	4.902	0.559	1.502	0.792	-0.269	0.672	225.2	19.0	730.1	225.2	19.0
14	027	14	4.902	0.700	1.501	0.781	-0.206	0.705	237.2	77.1	743.3	237.2	77.1
15	027	15	4.909	0.838	1.493	0.768	-0.217	0.691	237.2	71.1	722.2	237.2	71.1
16	027	16	4.909	0.979	1.490	0.770	-0.123	0.680	171.4	75.1	727.0	171.4	75.1
17	027	17	4.912	1.055	1.489	0.781	-0.072	0.696	149.4	93.1	736.1	149.4	93.1

STOP --

Table 6. Vorticities and Circulations for 37.5° Pitch Angle and X = 4.9

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	1	-0.700	0.489	0.020372	0.002791	0.1370
2	1	-0.489	0.488	0.009969	-0.009021	-0.9049
3	1	-0.367	0.488	0.007448	-0.046000	-6.1763
4	1	-0.280	0.484	0.005173	-0.030311	-5.8598

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	2	-0.700	0.566	0.022645	0.004116	0.1818
2	2	-0.490	0.564	0.011511	-0.000933	-0.0810
3	2	-0.350	0.563	0.011054	-0.015181	-1.3734
4	2	-0.245	0.560	0.005400	-0.009386	-1.7380
5	2	-0.175	0.558	0.005475	-0.017036	-3.1119
6	2	-0.105	0.561	0.005636	-0.016518	-2.9308
7	2	-0.035	0.563	0.005592	-0.016870	-3.0168
8	2	0.036	0.564	0.005531	-0.010786	-1.9502

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	3	-0.700	0.641	0.019474	0.002735	0.1404
2	3	-0.490	0.640	0.009656	0.006708	0.6947
3	3	-0.350	0.637	0.009777	0.000762	0.0779
4	3	-0.246	0.633	0.004980	-0.005207	-1.0456
5	3	-0.175	0.631	0.004752	-0.007792	-1.6397
6	3	-0.104	0.636	0.004850	0.003218	0.6636
7	3	-0.034	0.639	0.004976	-0.000328	-0.0659
8	3	0.036	0.639	0.005148	-0.005835	-1.1334
9	3	0.105	0.639	0.005266	-0.015272	-2.9003
10	3	0.175	0.637	0.005309	-0.023436	-4.4145
11	3	0.245	0.638	0.004902	-0.010162	-2.0731
12	3	0.315	0.637	0.005385	0.002878	0.5345
13	3	0.384	0.636	0.005493	0.014912	2.7144
14	3	0.454	0.637	0.004835	0.012886	2.6655

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	4	-0.700	0.713	0.021307	-0.000824	-0.0387
2	4	-0.490	0.712	0.010564	-0.000485	-0.0459
3	4	-0.350	0.712	0.010994	-0.019109	-1.7382
4	4	-0.246	0.712	0.006221	-0.016683	-2.6817
5	4	-0.176	0.708	0.005972	-0.016190	-2.7111
6	4	-0.105	0.708	0.005445	-0.033446	-6.1427
7	4	-0.035	0.712	0.005225	-0.041648	-7.9787
8	4	0.035	0.713	0.005251	-0.025565	-4.8681
9	4	0.105	0.715	0.005254	-0.009309	-1.7716
10	4	0.175	0.715	0.005562	-0.002256	-0.4056
11	4	0.245	0.712	0.005448	-0.004924	-0.9037
12	4	0.315	0.712	0.004916	-0.003595	-0.7313
13	4	0.384	0.712	0.005220	-0.005123	-0.9814
14	4	0.455	0.710	0.005517	-0.009221	-1.6714
15	4	0.526	0.710	0.005340	-0.001994	-0.3735
16	4	0.630	0.712	0.010487	0.001692	0.1613

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	5	-0.700	0.787	0.020032	0.005112	0.2552
2	5	-0.490	0.786	0.010098	0.006616	0.6552
3	5	-0.351	0.788	0.009899	0.003646	0.3683
4	5	-0.246	0.790	0.004788	-0.000725	-0.1515
5	5	-0.175	0.788	0.005194	-0.009116	-1.7550
6	5	-0.105	0.785	0.005556	-0.006851	-1.2330
7	5	-0.034	0.785	0.005066	-0.014917	-2.9505
8	5	0.035	0.787	0.005000	-0.016082	-3.2163
9	5	0.106	0.787	0.004888	-0.006554	-1.3408
10	5	0.175	0.788	0.004454	-0.002834	-0.6363
11	5	0.244	0.789	0.005342	0.007722	1.4455
12	5	0.315	0.786	0.005361	0.012635	2.3570
13	5	0.385	0.786	0.005304	0.011181	2.1000
14	5	0.456	0.788	0.005564	0.017430	3.1304
15	5	0.526	0.788	0.006442	0.020034	3.0812
16	5	0.630	0.789	0.010017	0.017698	1.6212
17	5	0.770	0.787	0.010727	0.003842	0.3582

Table 6. Conc ded

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	6	-0.700	0.863	0.022072	0.000424	0.0192
2	6	-0.490	0.858	0.010092	-0.002304	-0.2283
3	6	-0.350	0.860	0.010211	-0.002153	-0.2108
4	6	-0.245	0.863	0.005518	-0.002811	-0.5094
5	6	-0.175	0.861	0.005066	-0.005021	-0.9910
6	6	-0.104	0.862	0.005346	-0.012652	-2.3664
7	6	-0.034	0.863	0.005707	-0.016559	-2.9015
8	6	0.035	0.864	0.005770	-0.016408	-2.8434
9	6	0.106	0.862	0.005701	-0.007147	-1.2536
10	6	0.175	0.859	0.005372	-0.001412	-0.2628
11	6	0.245	0.861	0.004941	0.007293	1.4759
12	6	0.316	0.861	0.005203	0.020260	3.8940
13	6	0.386	0.863	0.005491	0.011112	2.0236
14	6	0.456	0.866	0.005513	0.006101	1.1067
15	6	0.526	0.866	0.005266	0.007905	1.5012
16	6	0.630	0.864	0.010153	0.001082	0.1066
17	6	0.770	0.861	0.009809	0.005970	0.6087

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	7	-0.700	0.976	0.041159	-0.005541	-0.1346
2	7	-0.490	0.974	0.022520	-0.008480	-0.3765
3	7	-0.350	0.975	0.021735	-0.007719	-0.3551
4	7	-0.245	0.976	0.010622	-0.005851	-0.5508
5	7	-0.174	0.971	0.010281	-0.007502	-0.7297
6	7	-0.105	0.973	0.010022	-0.013833	-1.3802
7	7	-0.036	0.973	0.009479	-0.008571	-0.9042
8	7	0.035	0.974	0.009982	-0.004067	-0.4074
9	7	0.105	0.978	0.010325	-0.003417	-0.3310
10	7	0.174	0.976	0.010975	0.008219	0.7489
11	7	0.245	0.973	0.010953	0.017546	1.6020
12	7	0.316	0.973	0.010381	0.024284	2.3393
13	7	0.386	0.976	0.010288	0.017474	1.6984
14	7	0.456	0.978	0.010289	0.016218	1.5762
15	7	0.525	0.980	0.010222	0.010067	0.9847
16	7	0.629	0.976	0.021242	0.005398	0.2541
17	7	0.770	0.971	0.021191	0.000786	0.0371

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	8	-0.700	1.127	0.043573	0.000985	0.0226
2	8	-0.490	1.128	0.020800	0.001997	0.0960
3	8	-0.351	1.127	0.020121	-0.000983	-0.0489
4	8	-0.245	1.126	0.011196	-0.000887	-0.0793
5	8	-0.174	1.126	0.011130	-0.003481	-0.3128
6	8	-0.105	1.124	0.010785	-0.004337	-0.4021
7	8	-0.035	1.119	0.010909	-0.003845	-0.3525
8	8	0.035	1.120	0.010722	-0.005245	-0.4892
9	8	0.104	1.127	0.010065	-0.002483	-0.2467
10	8	0.174	1.130	0.010897	-0.003814	-0.3500
11	8	0.245	1.128	0.010802	0.004845	0.4486
12	8	0.315	1.127	0.011385	0.015091	1.3256
13	8	0.386	1.125	0.010638	0.019747	1.8562
14	8	0.455	1.125	0.010380	0.012536	1.2078
15	8	0.525	1.130	0.010384	0.003035	0.2923
16	8	0.630	1.127	0.021107	0.002960	0.1402
17	8	0.771	1.124	0.022298	-0.003242	-0.1454

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	9	-0.700	1.280	0.041856	-0.003320	-0.0793
2	9	-0.490	1.278	0.021272	-0.001921	-0.0903
3	9	-0.351	1.276	0.021248	0.000427	0.0201
4	9	-0.246	1.278	0.010611	0.001610	0.1517
5	9	-0.175	1.281	0.010704	-0.000317	-0.0296
6	9	-0.104	1.280	0.010839	0.001138	0.1050
7	9	-0.035	1.276	0.010821	0.000101	0.0094
8	9	0.035	1.275	0.011032	0.001774	0.1608
9	9	0.105	1.277	0.010515	0.008313	0.7906
10	9	0.175	1.278	0.010324	0.011340	1.0985
11	9	0.244	1.280	0.010074	0.020270	2.0120
12	9	0.315	1.282	0.011092	0.026117	2.3546
13	9	0.386	1.279	0.010516	0.024302	2.3110
14	9	0.455	1.278	0.010945	0.027773	2.5376
15	9	0.525	1.278	0.010548	0.021073	1.9978
16	9	0.630	1.278	0.020876	0.012693	0.6080
17	9	0.770	1.281	0.021910	-0.001394	-0.0636

ROW 10: ZC = 1.43

PT.	YC	GAM	VORTIC
6	.07	.0020	.45
7	.21	.0184	.96
8	.35	.0186	1.08
9	.49	.0078	.41

STOP

Table 7. Flow Field Velocities at 37.5° Pitch Angle and X = 6.3

NPT	RUN	IY	JZ	LVDIR		UT	P
43	023	8	1	1	2	2.9442	0.11079

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
35	023	1	6.300	-0.979	0.501	0.744	0.051	0.816	241.5	278.3	761.7	241.6	278.4
36	023	2	6.298	-0.840	0.506	0.724	0.081	0.824	252.4	312.3	756.8	252.5	312.5
37	023	3	6.298	-0.700	0.504	0.716	0.124	0.854	266.2	357.7	759.9	266.6	357.8
38	023	4	6.302	-0.561	0.500	0.671	0.178	0.861	282.9	415.9	743.2	283.4	416.0
39	023	5	6.297	-0.491	0.504	0.670	0.234	0.836	222.6	398.1	729.0	222.8	398.4
40	023	6	6.304	-0.420	0.497	0.623	0.248	0.843	263.2	449.6	708.0	263.2	449.6
41	023	7	6.301	-0.351	0.498	0.593	0.154	0.295	-263.6	-147.2	451.7	-263.6	-147.2
42	023	8	6.305	-0.278	0.500	0.589	0.876	0.308	-662.6	6.1	459.7	-662.6	6.1

NPT	RUN	IY	JZ	LVDIR		UT	P
23	018	20	2	1	2	36.340	16.663

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	018	1	6.300	-0.980	0.599	0.748	0.046	0.814	237.1	269.9	756.1	237.3	270.0
2	018	2	6.303	-0.841	0.597	0.726	0.088	0.827	248.4	313.4	756.1	249.1	313.4
3	018	3	6.304	-0.700	0.597	0.716	0.110	0.836	256.3	338.0	758.1	257.0	338.2
4	018	4	6.301	-0.561	0.598	0.711	0.169	0.849	239.8	366.3	758.1	240.3	366.4
5	018	5	6.302	-0.491	0.599	0.705	0.198	0.852	232.1	380.8	758.1	233.0	381.0
6	018	6	6.302	-0.420	0.599	0.693	0.177	0.852	255.2	388.6	756.1	255.2	388.6
7	018	7	6.300	-0.351	0.599	0.666	0.121	0.888	346.9	435.6	746.1	346.9	435.6
8	018	8	6.304	-0.280	0.597	0.776	0.148	0.491	-201.7	-89.1	643.9	-201.7	-89.1
9	018	9	6.300	-0.210	0.598	0.868	-0.077	0.158	-518.9	-575.8	549.8	-518.9	-575.8
10	018	10	6.301	-0.140	0.600	0.911	-0.188	0.085	-574.8	-716.0	543.8	-574.8	-716.0
11	018	11	6.303	-0.070	0.598	1.033	-0.196	0.040	-722.4	-868.3	591.7	-722.4	-868.3
12	018	12	6.302	-0.002	0.599	1.008	-0.131	0.082	-694.5	-792.1	597.9	-694.5	-792.1
13	018	13	6.300	0.071	0.600	1.042	-0.142	0.035	-774.3	-880.3	599.9	-774.3	-860.3
14	018	14	6.301	0.140	0.597	1.039	-0.178	-0.045	-834.1	-966.4	559.8	-834.1	-966.4
15	018	15	6.305	0.211	0.594	1.065	-0.137	-0.074	-912.0	-1012.5	561.8	-912.0	-1012.5
16	018	16	6.301	0.279	0.558	1.090	-0.146	-0.002	-852.1	-960.4	609.9	-852.1	-960.4
17	018	17	6.302	0.351	0.597	1.058	-0.401	0.043	-622.7	-924.3	605.9	-622.7	-924.3
18	018	18	6.303	0.421	0.598	0.998	-0.441	0.181	-399.2	-736.1	637.9	-399.2	-736.1
19	018	19	6.301	0.491	0.597	0.957	-0.190	0.435	-223.6	-367.5	720.0	-223.6	-367.5
20	018	20	6.304	0.560	0.597	0.899	-0.284	0.565	23.7	-193.3	744.1	23.7	-193.3

Table 7. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
46	018	23	3	1	2	1.1775	0.17494E-01

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
24	018	1	6.298	-0.981	0.701	0.755	0.056	0.795	207.5	248.1	760.1	207.5	248.1
25	018	2	6.297	-0.840	0.704	0.746	0.090	0.792	192.9	260.2	760.1	193.4	260.4
26	018	3	6.297	-0.700	0.703	0.730	0.141	0.805	192.7	299.5	760.1	193.1	299.7
27	018	4	6.298	-0.560	0.703	0.730	0.144	0.816	202.5	311.1	760.1	203.0	311.2
28	018	5	6.299	-0.491	0.702	0.715	0.192	0.824	196.5	342.2	756.1	197.2	342.3
29	018	6	6.304	-0.420	0.697	0.725	0.153	0.812	197.3	312.7	756.1	197.3	312.7
30	018	7	6.297	-0.350	0.702	0.745	0.192	0.791	133.5	277.5	750.1	133.5	377.5
31	018	8	6.300	-0.280	0.701	0.725	0.265	0.743	55.7	255.4	720.0	55.7	255.4
32	018	9	6.298	-0.210	0.703	0.877	0.138	0.453	-325.4	-219.3	688.0	-325.4	-219.3
33	018	10	6.297	-0.140	0.704	0.893	0.118	0.338	-455.1	-363.5	643.9	-455.1	-363.5
34	018	11	6.298	-0.070	0.702	0.903	-0.013	0.301	-431.1	-439.6	635.9	-431.1	-439.6
35	018	12	6.296	0.000	0.705	0.955	-0.040	0.228	-536.9	-565.8	627.9	-536.9	-565.8
36	018	13	6.299	0.070	0.704	1.005	-0.079	0.071	-734.4	-792.1	591.9	-734.4	-792.1
37	018	14	6.300	0.139	0.701	1.006	-0.187	0.043	-700.5	-840.2	577.8	-700.5	-840.2
38	018	15	6.298	0.210	0.707	1.026	-0.402	0.008	-636.6	-940.4	575.8	-636.6	-940.4
39	018	16	6.301	0.281	0.700	0.985	-0.409	0.074	-518.9	-826.2	575.8	-518.9	-826.2
40	018	17	6.298	0.350	0.704	0.966	-0.520	0.111	-405.2	-802.2	589.8	-405.2	-802.2
41	018	18	6.299	0.421	0.705	0.907	-0.401	0.264	-249.6	-553.8	617.9	-249.6	-553.8
42	018	19	6.300	0.490	0.705	0.913	-0.387	0.402	-109.9	-403.6	680.0	-109.9	-403.6
43	018	20	6.302	0.560	0.702	0.910	-0.348	0.461	-64.0	-327.5	700.0	-64.0	-327.5
44	018	21	6.296	0.701	0.704	0.876	-0.125	0.570	-42.1	-137.2	728.0	-42.1	-137.2
45	018	22	6.302	0.839	0.703	0.861	-0.056	0.593	-42.1	-85.1	728.0	-42.1	-85.1
46	018	23	6.305	0.980	0.638	0.861	-0.056	0.592	-42.1	-85.1	728.0	-42.1	-85.1

NPT	RUN	IY	JZ	LUDIR		UT	P
69	018	23	4	1	2	36.388	16.706

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
47	018	1	6.294	-0.979	0.804	0.758	0.072	0.773	172.3	225.7	760.1	172.8	226.0
48	018	2	6.295	-0.841	0.802	0.754	0.102	0.789	174.9	250.9	758.1	175.5	251.0
49	018	3	6.301	-0.700	0.798	0.740	0.125	0.801	187.6	281.6	758.1	188.6	281.7
50	018	4	6.299	-0.560	0.797	0.730	0.146	0.811	195.2	305.2	758.1	195.6	305.4
51	018	5	6.303	-0.489	0.796	0.743	0.197	0.800	142.7	291.4	758.1	143.0	291.7
52	018	6	6.299	-0.419	0.798	0.704	0.142	0.787	195.3	302.8	738.1	195.3	302.8
53	018	7	6.300	-0.351	0.736	0.718	0.231	0.803	147.4	321.5	742.1	147.4	321.5
54	018	8	6.300	-0.279	0.799	0.705	0.318	0.743	41.7	281.4	708.0	41.7	281.4
55	018	9	6.301	-0.210	0.799	0.728	0.205	0.646	-20.2	135.2	684.0	-20.2	135.2
56	018	10	6.301	-0.140	0.796	0.774	0.064	0.496	-145.8	-97.1	645.9	-145.8	-97.1
57	018	11	6.300	-0.070	0.798	0.840	0.021	0.443	-235.6	-219.3	657.9	-235.6	-219.3
58	018	12	6.304	0.001	0.795	0.835	-0.177	0.262	-321.4	-455.7	579.8	-321.4	-455.7
59	018	13	6.304	0.069	0.796	0.866	-0.006	0.172	-542.9	-545.8	555.8	-542.9	-545.8
60	018	14	6.301	0.139	0.796	0.904	-0.106	0.094	-610.7	-690.0	547.8	-610.7	-690.0
61	018	15	6.296	0.210	0.800	0.967	-0.328	0.064	-568.8	-818.2	569.8	-568.8	-818.2
62	018	16	6.299	0.280	0.798	1.009	-0.020	0.025	-820.2	-832.2	571.8	-820.2	-832.2
63	018	17	6.301	0.350	0.797	1.032	-0.266	0.113	-598.7	-798.1	619.9	-598.7	-798.1
64	018	18	6.299	0.421	0.798	0.926	-0.415	0.194	-337.4	-653.9	601.9	-337.4	-653.9
65	018	19	6.301	0.491	0.798	0.970	-0.466	0.272	-259.6	-615.9	662.0	-259.6	-615.9
66	018	20	6.300	0.559	0.800	0.866	-0.143	0.395	-217.7	-325.5	649.9	-217.7	-325.5
67	018	21	6.301	0.699	0.797	0.881	-0.101	0.480	-161.8	-239.3	704.0	-161.8	-239.3

Table 7. Continued

68	018	22	6.307	0.839	0.789	0.830	0.041	0.563	-105.9	-75.1	704.0	-105.9	-75.1
69	018	23	6.294	0.980	0.806	0.823	0.005	0.593	-46.1	-43.1	720.0	-46.1	-43.1

NPT	RUN	IY	JZ	LUDIR		UT	P
92	018	23	5	1	2	36.394	16.712

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
70	018	1	6.309	-0.980	0.891	0.728	0.144	0.792	175.4	283.4	744.1	175.4	283.4
71	018	2	6.306	-0.840	0.897	0.739	0.092	0.782	185.3	253.4	744.1	185.3	253.4
72	018	3	6.308	-0.699	0.895	0.730	0.131	0.781	171.4	269.4	744.1	171.4	269.4
73	018	4	6.303	-0.559	0.896	0.718	0.146	0.794	187.3	297.4	744.1	187.3	297.4
74	018	5	6.310	-0.489	0.891	0.700	0.218	0.821	191.3	355.5	744.1	191.3	355.5
75	018	6	6.306	-0.419	0.895	0.726	0.150	0.793	175.4	287.4	744.1	175.4	287.4
76	018	7	6.306	-0.350	0.897	0.719	0.140	0.815	211.3	315.5	748.1	211.3	315.5
77	018	8	6.306	-0.280	0.894	0.738	0.207	0.782	121.5	277.4	746.1	121.5	277.4
78	018	9	6.306	-0.209	0.897	0.701	0.238	0.785	139.5	319.5	730.1	139.5	319.5
79	018	10	6.302	-0.140	0.902	0.681	0.394	0.690	-40.1	259.4	676.0	-40.1	259.4
80	018	11	6.307	-0.070	0.895	0.702	0.144	0.552	-68.0	41.1	625.9	-68.0	41.1
81	018	12	6.301	0.000	0.900	0.735	0.011	0.407	-181.8	-173.2	583.8	-181.8	-173.2
82	018	13	6.307	0.070	0.892	0.756	-0.030	0.300	-293.5	-315.5	547.8	-293.5	-315.5
83	018	14	6.303	0.139	0.896	0.890	-0.156	0.173	-475.0	-591.9	567.8	-475.0	-591.9
84	018	15	6.313	0.209	0.888	0.935	-0.204	0.081	-592.7	-746.1	557.8	-592.7	-746.1
85	018	16	6.301	0.281	0.903	0.914	-0.225	0.108	-530.9	-700.0	555.8	-530.9	-700.0
86	018	17	6.305	0.350	0.898	0.949	-0.496	0.086	-431.1	-808.2	567.8	-431.1	-808.2
87	018	18	6.307	0.421	0.893	0.916	-0.332	0.179	-393.2	-645.9	589.8	-393.2	-645.9
88	018	19	6.312	0.490	0.890	0.921	-0.134	0.293	-381.3	-481.7	635.9	-381.3	-481.7
89	018	20	6.306	0.560	0.894	0.888	0.003	0.321	-399.2	-395.6	625.9	-399.2	-395.6
90	018	21	6.306	0.700	0.857	0.871	-0.029	0.454	-221.7	-243.4	680.0	-221.7	-243.4
91	018	22	6.312	0.841	0.889	0.845	0.056	0.514	-181.8	-139.2	692.0	-181.8	-139.2
92	018	23	6.299	0.981	0.905	0.813	-0.053	0.591	-6.2	-47.1	702.0	-6.2	-47.1

NPT	RUN	IY	JZ	LUDIR		UT	P
17	022	17	6	1	2	36.214	16.762

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	022	1	6.299	-1.121	0.999	0.763	0.089	0.755	137.6	204.0	750.1	138.2	204.3
2	022	2	6.300	-0.981	1.000	0.760	0.100	0.765	144.3	219.1	750.1	144.4	219.2
3	022	3	6.303	-0.841	0.998	0.747	0.117	0.778	160.6	247.9	750.1	161.2	248.1
4	022	4	6.303	-0.700	0.998	0.743	0.137	0.783	157.1	258.9	744.1	157.5	259.3
5	022	5	6.301	-0.561	1.000	0.736	0.166	0.792	156.7	280.8	746.1	157.1	281.2
6	022	6	6.303	-0.421	0.997	0.723	0.297	0.817	120.8	345.3	752.1	120.9	345.6
7	022	7	6.301	-0.282	1.000	0.671	0.160	0.883	315.0	433.6	748.1	315.0	433.6
8	022	8	6.301	-0.139	1.002	0.665	0.177	0.753	167.4	299.4	690.0	167.4	299.4
9	022	9	6.300	0.000	1.000	0.764	-0.041	0.469	-105.9	-137.2	619.9	-105.9	-137.2
10	022	10	6.307	0.139	0.993	0.853	-0.063	0.223	-441.1	-487.7	567.8	-441.1	-487.7
11	022	11	6.301	0.280	0.997	1.007	0.103	0.067	-832.2	-752.1	581.8	-832.2	-752.1
12	022	12	6.307	0.421	0.931	0.955	0.016	0.110	-692.5	-678.0	571.8	-692.5	-678.0
13	022	13	6.309	0.560	0.990	0.874	0.297	0.336	-540.9	-313.5	529.9	-540.9	-313.5
14	022	14	6.306	0.701	0.992	0.831	0.207	0.517	-251.6	-95.1	680.0	-251.6	-95.1
15	022	15	6.316	0.839	0.955	0.821	0.044	0.600	-58.1	-25.0	710.0	-58.1	-25.0
16	022	16	6.309	0.980	0.990	0.790	0.066	0.666	27.7	77.1	722.0	27.7	77.1
17	022	17	6.309	1.055	0.990	0.808	-0.054	0.660	75.6	33.0	734.1	75.6	33.0

Table 7. Continued

NPT	RUN	IY	JZ	LUDIR	UT	P
51	021	17	7	1 2	27.283	9.5136

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
35	021	1	6.301	-1.120	1.101	0.765	0.092	0.752	130.2	198.8	750.1	130.5	199.0
36	021	2	6.302	-0.980	1.097	0.767	0.114	0.750	113.9	199.3	750.1	114.1	199.6
37	021	3	6.302	-0.840	1.096	0.777	0.149	0.759	93.9	205.0	750.1	94.1	205.2
38	021	4	6.304	-0.698	1.096	0.755	0.161	0.767	116.5	237.5	750.1	117.0	237.7
39	021	5	6.305	-0.559	1.095	0.722	0.198	0.791	149.8	299.4	742.1	150.1	300.1
40	021	6	6.305	-0.420	1.096	0.697	0.199	0.817	199.3	345.5	740.1	199.3	349.5
41	021	7	6.297	-0.280	1.104	0.667	0.247	0.865	253.2	437.6	738.1	253.2	437.6
42	021	8	6.302	-0.140	1.099	0.698	0.324	0.809	117.5	361.5	732.1	117.5	361.5
43	021	9	6.304	-0.001	1.094	0.744	0.063	0.615	11.8	59.1	680.0	11.8	59.1
44	021	10	6.300	0.141	1.102	0.848	0.192	0.302	-497.0	-349.5	601.3	-497.0	-349.5
45	021	11	6.305	0.280	1.092	0.916	0.115	0.119	-698.5	-609.9	550.0	-698.5	-609.9
46	021	12	6.304	0.422	1.097	0.942	0.184	0.085	-812.2	-670.0	559.8	-812.2	-670.0
47	021	13	6.304	0.559	1.097	0.897	0.127	0.200	-616.7	-517.7	585.8	-616.7	-517.7
48	021	14	6.298	0.701	1.104	0.853	0.013	0.457	-227.6	-217.3	674.0	-227.6	-217.3
49	021	15	6.304	0.841	1.095	0.812	-0.066	0.600	11.8	-39.1	706.0	11.8	-39.1
50	021	16	6.303	0.980	1.097	0.795	0.024	0.646	21.7	39.1	716.0	21.7	39.1
51	021	17	6.306	1.055	1.093	0.804	-0.023	0.666	67.6	49.1	732.1	67.6	49.1

NPT	RUN	IY	JZ	LUDIR	UT	P
34	021	17	8	1 2	36.100	16.657

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
18	021	1	6.303	-1.120	1.200	0.763	0.093	0.739	117.3	187.4	746.1	117.6	187.7
19	021	2	6.300	-0.980	1.203	0.758	0.113	0.755	126.8	211.4	744.1	127.0	211.6
20	021	3	6.302	-0.839	1.199	0.758	0.142	0.745	101.0	207.8	744.1	101.3	208.2
21	021	4	6.304	-0.699	1.199	0.749	0.160	0.773	128.0	247.8	744.1	128.2	248.0
22	021	5	6.304	-0.561	1.198	0.734	0.187	0.792	146.5	287.1	748.1	146.9	287.2
23	021	6	6.302	-0.420	1.200	0.706	0.317	0.815	122.6	362.7	744.1	122.8	362.9
24	021	7	6.302	-0.279	1.200	0.648	0.266	0.857	247.2	447.6	730.1	247.2	447.6
25	021	8	6.304	-0.140	1.199	0.554	0.459	0.812	167.4	515.7	657.9	167.4	515.7
26	021	9	6.301	0.000	1.202	0.625	0.353	0.698	39.7	305.4	641.9	39.7	305.4
27	021	10	6.306	0.141	1.198	0.709	0.372	0.386	-387.2	-105.2	557.8	-387.2	-105.2
28	021	11	6.301	0.280	1.202	0.814	0.494	0.252	-692.5	-317.5	557.8	-692.5	-317.5
29	021	12	6.305	0.421	1.198	0.901	0.502	0.186	-858.1	-469.7	587.8	-858.1	-469.7
30	021	13	6.302	0.561	1.201	0.877	0.485	0.291	-698.5	-329.5	609.9	-698.5	-329.5
31	021	14	6.304	0.700	1.200	0.842	0.150	0.407	-349.3	-235.3	639.9	-349.3	-235.3
32	021	15	6.306	0.840	1.198	0.787	0.049	0.587	-48.1	-11.0	692.0	-48.1	-11.0
33	021	16	6.304	0.981	1.200	0.689	0.062	0.671	123.5	169.2	674.0	123.5	169.2
34	021	17	6.308	1.055	1.195	0.736	-0.025	0.690	153.4	133.2	706.0	153.4	133.2

Table 7. Continued

NPT	RUN	IY	JZ	LUDIR		UT	P
17	021	17	9	1	2	35.875	16.450

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	021	1	6.301	-1.120	1.300	0.780	0.092	0.731	93.5	162.6	748.1	93.8	162.8
2	021	2	6.301	-0.980	1.300	0.777	0.120	0.732	82.0	171.8	748.1	82.2	172.0
3	021	3	6.300	-0.841	1.300	0.777	0.144	0.735	71.6	180.3	748.1	73.2	180.5
4	021	4	6.300	-0.700	1.298	0.769	0.180	0.742	65.5	201.6	748.1	66.5	202.1
5	021	5	6.302	-0.558	1.296	0.755	0.226	0.766	77.1	247.9	748.1	77.5	248.4
6	021	6	6.301	-0.420	1.299	0.724	0.335	0.796	74.0	325.2	738.1	74.9	325.6
7	021	7	6.298	-0.280	1.304	0.685	0.540	0.804	-0.5	408.1	724.0	9.2	408.2
8	021	8	6.300	-0.140	1.302	0.660	0.575	0.794	-9.3	425.7	706.0	16.6	425.9
9	021	9	6.297	0.001	1.303	0.671	0.639	0.729	-127.9	357.5	686.0	-127.9	357.5
10	021	10	6.304	0.139	1.295	0.666	1.050	0.577	-530.9	271.4	619.9	-530.9	271.4
11	021	11	6.300	0.280	1.299	0.823	0.816	0.336	-796.2	-173.2	601.9	-796.2	-173.2
12	021	12	6.300	0.421	1.300	0.886	0.681	0.237	-878.0	-359.5	591.9	-878.0	-359.5
13	021	13	6.298	0.561	1.302	0.895	0.411	0.260	-704.5	-391.6	605.9	-704.5	-391.6
14	021	14	6.305	0.700	1.296	0.834	0.344	0.393	-470.0	-245.0	806.1	808.3	5.1
15	021	15	6.306	0.841	1.292	0.774	0.277	0.525	-235.6	-25.0	655.9	-235.6	-25.0
16	021	16	6.298	0.979	1.304	0.745	0.228	0.632	-64.0	109.2	686.0	-64.0	109.2
17	021	17	6.299	1.055	1.301	0.745	0.105	0.674	53.7	133.2	708.0	53.7	133.2

NPT	RUN	IY	JZ	LUDIR		UT	P
17	020	17	10	1	2	3.1590	0.12829

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	020	1	6.299	-1.120	1.396	0.798	0.118	0.702	32.3	120.8	742.1	32.8	121.2
2	020	2	6.300	-0.979	1.398	0.790	0.125	0.721	55.6	148.4	742.1	56.1	148.6
3	020	3	6.301	-0.840	1.397	0.785	0.145	0.716	42.5	151.7	742.1	45.8	152.3
4	020	4	6.300	-0.701	1.397	0.758	0.184	0.727	56.9	196.3	738.1	57.6	196.5
5	020	5	6.300	-0.561	1.400	0.740	0.213	0.741	69.6	229.8	728.0	69.6	229.8
6	020	6	6.300	-0.420	1.398	0.721	0.342	0.758	31.7	290.4	726.0	31.7	290.4
7	020	7	6.301	-0.280	1.399	0.682	0.468	0.754	-12.2	343.5	704.0	-12.2	343.5
8	020	8	6.303	-0.139	1.394	0.675	0.406	0.716	-12.2	295.4	682.0	-12.2	295.4
9	020	9	6.301	-0.000	1.399	0.691	0.402	0.596	-157.8	149.2	643.9	-157.8	149.2
10	020	10	6.299	0.139	1.399	0.764	0.625	0.454	-501.0	-29.0	613.9	-501.0	-29.0
11	020	11	6.302	0.281	1.393	0.842	0.685	0.345	-718.4	-201.3	609.9	-718.4	-201.3
12	020	12	6.304	0.419	1.395	0.898	0.599	0.310	-756.3	-303.4	625.9	-756.3	-303.4
13	020	13	6.303	0.560	1.395	0.833	0.527	0.395	-566.8	-169.2	625.9	-566.8	-169.2
14	020	14	6.304	0.699	1.397	0.783	0.484	0.490	-399.2	-31.0	643.9	-399.2	-31.0
15	020	15	6.301	0.841	1.398	0.817	0.055	0.577	-86.0	-45.1	696.0	-86.0	-45.1
16	020	16	6.300	0.982	1.398	0.764	-0.062	0.690	149.4	101.1	716.0	149.4	101.1
17	020	17	6.301	1.055	1.399	0.761	0.010	0.721	145.4	151.2	726.0	145.4	151.2

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Table 7. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
23	019	23	11	1	2	36.391	17.024

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	019	1	6.299	-0.980	1.499	0.777	0.113	0.705	55.2	138.3	722.0	55.8	138.5
2	019	2	6.299	-0.839	1.501	0.767	0.119	0.703	58.7	148.3	728.0	59.0	148.4
3	019	3	6.300	-0.699	1.502	0.765	0.152	0.704	41.5	155.7	724.0	42.2	155.9
4	019	4	6.298	-0.559	1.501	0.765	0.207	0.715	22.9	177.4	724.0	25.2	177.8
5	019	5	6.302	-0.490	1.499	0.750	0.239	0.703	4.7	183.9	714.0	14.9	184.7
6	019	6	6.301	-0.420	1.500	0.724	0.277	0.707	9.3	218.0	704.0	15.1	218.7
7	019	7	6.301	-0.351	1.501	0.736	0.314	0.713	-15.6	222.1	714.0	17.5	222.8
8	019	8	6.299	-0.279	1.503	0.711	0.238	0.714	49.7	227.9	696.0	49.7	227.9
9	019	9	6.302	-0.211	1.499	0.700	0.290	0.703	17.8	236.5	688.0	17.8	236.5
10	019	10	6.300	-0.139	1.500	0.681	0.428	0.665	-85.9	235.9	672.0	-7972.8	-8008.7
11	019	11	6.302	-0.070	1.498	0.662	0.565	0.627	-189.7	235.3	629.9	-189.7	235.3
12	019	12	6.302	-0.001	1.500	0.681	0.681	0.602	-299.5	213.3	629.9	-299.5	213.3
13	019	13	6.298	0.070	1.501	0.717	0.660	0.573	-351.3	149.2	641.9	-351.3	149.2
14	019	14	6.301	0.140	1.502	0.782	0.577	0.521	-415.2	21.0	653.9	-415.2	21.0
15	019	15	6.303	0.210	1.499	0.777	0.678	0.505	-487.0	27.0	645.9	-487.0	27.0
16	019	16	6.300	0.281	1.503	0.837	0.661	0.435	-610.7	-105.2	653.9	-610.7	-105.2
17	019	17	6.303	0.350	1.497	0.848	0.737	0.436	-660.6	-99.1	657.9	-660.6	-99.1
18	019	18	6.303	0.420	1.499	0.848	0.677	0.409	-652.6	-139.2	643.9	-652.6	-139.2
19	019	19	6.300	0.488	1.504	0.854	0.597	0.420	-600.7	-147.2	651.9	-600.7	-147.2
20	019	20	6.302	0.559	1.501	0.891	0.432	0.411	-548.8	-219.7	670.0	-548.8	-219.7
21	019	21	6.306	0.700	1.494	0.806	0.405	0.556	-300.0	7.0	682.0	-582.8	7.0
22	019	22	6.303	0.840	1.500	0.727	0.273	0.652	-52.1	155.2	685.8	-52.1	155.2
23	019	23	6.300	0.979	1.503	0.734	0.238	0.719	35.7	215.3	716.0	35.7	215.3

NPT	RUN	IY	JZ	LVDIR		UT	P
34	023	17	12	1	2	36.289	16.832

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
18	023	1	6.299	-1.120	1.700	0.784	0.093	0.675	27.3	97.3	723.7	28.5	97.7
19	023	2	6.298	-0.980	1.701	0.782	0.108	0.664	8.8	90.2	721.8	12.3	90.8
20	023	3	6.298	-0.841	1.702	0.774	0.125	0.656	-2.5	91.7	714.3	6.2	92.1
21	023	4	6.301	-0.702	1.699	0.771	0.158	0.649	-27.8	91.9	707.4	28.3	92.1
22	023	5	6.301	-0.559	1.698	0.765	0.199	0.644	-51.8	99.8	705.7	55.3	101.6
23	023	6	6.301	-0.420	1.698	0.797	0.244	0.595	-158.1	27.5	698.4	158.5	31.9
24	023	7	6.300	-0.279	1.698	0.774	0.320	0.575	-204.4	38.5	675.5	205.3	43.2
25	023	8	6.300	-0.140	1.700	0.766	0.359	0.551	-247.6	26.1	663.8	-247.6	26.1
26	023	9	6.302	-0.000	1.698	0.817	0.385	0.467	-399.2	-105.1	656.5	-399.2	-105.1
27	023	10	6.299	0.139	1.704	0.853	0.457	0.380	-564.8	-216.8	635.8	-564.8	-216.8
28	023	11	6.302	0.280	1.700	0.839	0.532	0.370	-608.7	-202.8	624.8	-608.7	-202.8
29	023	12	6.300	0.421	1.702	0.765	0.621	0.414	-550.8	-75.1	605.6	-550.8	-75.1
30	023	13	6.304	0.560	1.695	0.713	0.515	0.507	-341.4	52.0	616.5	-341.4	52.0
31	023	14	6.301	0.700	1.702	0.657	0.343	0.584	-107.9	152.5	616.0	-107.9	152.5
32	023	15	6.303	0.839	1.700	0.634	0.042	0.741	259.2	289.5	672.0	259.2	289.5
33	023	16	6.305	0.979	1.695	0.679	-0.093	0.798	358.9	286.5	716.0	358.9	286.5
34	023	17	6.308	1.055	1.692	0.721	-0.158	0.784	346.9	224.6	738.1	346.9	224.6

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Table 7. Continued

NPT	RUN	IY	JZ	LVDIR		UT	P
17	023	17	13	1	2	36.141	16.695

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
1	023	1	6.299	-1.119	1.798	0.793	0.074	0.663	18.6	73.8	726.1	19.6	74.1
2	023	2	6.301	-0.980	1.795	0.792	0.092	0.642	-15.1	53.9	717.6	18.1	54.8
3	023	3	6.306	-0.839	1.793	0.794	0.122	0.636	-40.2	52.0	716.7	41.1	52.4
4	023	4	6.302	-0.701	1.797	0.783	0.178	0.632	-66.9	67.8	707.9	67.2	121.4
5	023	5	6.298	-0.560	1.799	0.781	0.213	0.636	-80.9	78.8	700.5	82.2	136.8
6	023	6	6.303	-0.422	1.795	0.794	0.229	0.578	-164.8	8.3	685.8	165.1	12.1
7	023	7	6.299	-0.280	1.801	0.801	0.321	0.550	-253.7	-12.1	675.3	253.9	125.7
8	023	8	6.299	-0.141	1.797	0.820	0.367	0.478	-381.8	-99.6	666.3	382.2	187.9
9	023	9	6.301	0.002	1.796	0.784	0.750	0.494	-552.5	22.5	651.6	552.6	272.3
10	023	10	6.299	0.139	1.803	0.886	0.368	0.320	-606.7	-326.6	626.5	-606.7	-326.6
11	023	11	6.299	0.279	1.798	0.860	0.413	0.280	-660.6	-343.8	599.5	-660.6	-343.8
12	023	12	6.300	0.419	1.799	0.835	0.325	0.389	-465.1	-217.3	629.9	-465.1	-217.3
13	023	13	6.301	0.563	1.800	0.766	0.459	0.563	-291.5	59.1	670.0	-291.5	59.1
14	023	14	6.300	0.700	1.796	0.627	0.156	0.816	283.1	399.6	700.0	283.1	399.6
15	023	15	6.303	0.839	1.798	0.700	0.057	0.853	317.0	357.5	752.1	317.0	357.5
16	023	16	6.303	0.980	1.796	0.707	0.059	0.859	317.0	359.5	760.1	317.0	359.5
17	023	17	6.303	1.055	1.795	0.698	-0.025	0.831	341.0	319.5	742.1	341.0	319.5

NPT	RUN	IY	JZ	LVDIR		UT	P
68	022	17	14	1	2	35.594	16.193

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
52	022	1	6.300	-1.121	2.001	0.811	0.109	0.658	-22.6	58.5	721.7	27.4	59.3
53	022	2	6.301	-0.979	2.004	0.806	0.100	0.635	-40.0	35.5	720.6	41.1	35.8
54	022	3	6.300	-0.841	2.002	0.812	0.129	0.635	-59.4	36.3	710.7	60.5	37.0
55	022	4	6.301	-0.700	2.002	0.830	0.167	0.617	-115.6	8.3	713.1	116.1	14.3
56	022	5	6.301	-0.559	2.002	0.824	0.154	0.587	-138.7	-21.7	709.2	138.8	23.7
57	022	6	6.300	-0.421	2.001	0.810	0.175	0.538	-190.6	-59.1	671.9	190.8	60.2
58	022	7	6.300	-0.279	2.002	0.853	0.192	0.496	-285.1	-139.2	682.8	285.2	139.6
59	022	8	6.300	-0.141	2.001	0.879	0.225	0.452	-371.3	-201.6	673.3	371.3	202.0
60	022	9	6.300	-0.001	2.002	0.921	0.248	0.377	-503.8	-315.5	667.9	503.9	316.1
61	022	10	6.299	0.139	2.003	0.886	0.167	0.293	-520.9	-393.9	612.8	-520.9	-393.9
62	022	11	6.299	0.280	2.002	0.834	0.169	0.369	-393.2	-265.1	615.9	-393.2	-265.1
63	022	12	6.299	0.420	2.004	0.756	0.276	0.505	-237.6	-30.9	627.9	-237.6	-30.9
64	022	13	6.300	0.561	2.004	0.680	0.079	0.654	99.6	157.2	647.9	99.6	157.2
65	022	14	6.299	0.700	2.005	0.687	-0.135	0.698	265.1	161.2	678.0	265.1	161.2
66	022	15	6.299	0.841	2.004	0.727	-0.122	0.768	299.1	205.3	722.0	299.1	205.3
67	022	16	6.299	0.980	2.004	0.730	-0.085	0.773	281.1	215.3	726.4	281.1	215.3
68	022	17	6.302	1.055	2.002	0.728	-0.084	0.770	280.0	215.0	721.4	368.0	5.1

Table 7. Concluded

NPT	RUN	IY	JZ	LVDIR		UT	P
51	022	17	15	1	2	36.493	17.021

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
35	022	1	6.302	-1.122	2.496	0.803	0.078	0.631	-27.6	30.7	717.9	28.1	32.4
36	022	2	6.304	-0.981	2.496	0.809	0.071	0.618	-44.3	9.2	715.5	44.8	11.8
37	022	3	6.298	-0.841	2.502	0.812	0.085	0.603	-72.3	-7.3	716.6	72.6	12.9
38	022	4	6.299	-0.699	2.499	0.820	0.104	0.588	-105.2	-26.7	708.2	105.5	28.6
39	022	5	6.304	-0.559	2.497	0.837	0.090	0.560	-143.3	-74.6	707.1	143.6	75.4
40	022	6	6.300	-0.421	2.500	0.846	0.103	0.545	-176.1	-97.4	708.0	176.1	97.5
41	022	7	6.303	-0.280	2.500	0.862	0.077	0.525	-195.5	-137.2	705.1	195.6	137.4
42	022	8	6.299	-0.141	2.502	0.886	0.123	0.496	-272.3	-178.5	699.0	272.4	179.3
43	022	9	6.305	-0.001	2.497	0.880	0.008	0.436	-269.5	-263.4	673.5	-269.5	-263.4
44	022	10	6.302	0.140	2.501	0.897	-0.104	0.437	-221.7	-301.2	691.3	-221.7	-301.2
45	022	11	6.305	0.282	2.498	0.860	-0.134	0.480	-123.9	-225.9	685.1	-123.9	-225.9
46	022	12	6.302	0.421	2.501	0.863	-0.149	0.552	-38.1	-152.5	719.4	-38.1	-152.5
47	022	13	6.306	0.559	2.497	0.843	-0.211	0.599	67.6	-92.7	722.4	67.6	-92.7
48	022	14	6.304	0.701	2.497	0.799	-0.195	0.648	149.4	0.2	721.6	149.4	0.2
49	022	15	6.301	0.840	2.504	0.765	-0.165	0.666	181.4	55.0	707.3	181.4	55.0
50	022	16	6.305	0.980	2.497	0.767	-0.115	0.697	187.3	97.7	732.7	187.3	97.7
51	022	17	6.303	1.055	2.499	0.752	-0.134	0.692	203.3	100.1	711.6	203.3	100.1

NPT	RUN	IY	JZ	LVDIR		UT	P
34	022	17	16	1	2	36.173	16.724

IPT	RUN	I	X	Y	Z	U	V	W	UB1	UG1	UG2	RMSB	RMSG
18	022	1	6.304	-1.118	2.996	0.815	0.047	0.616	-36.9	-2.0	717.4	37.3	10.3
19	022	2	6.305	-0.982	2.996	0.820	0.054	0.621	-39.7	0.7	718.1	40.0	4.7
20	022	3	6.304	-0.842	2.999	0.824	0.040	0.601	-58.1	-27.8	717.2	58.3	28.7
21	022	4	6.303	-0.700	2.399	0.824	0.050	0.602	-61.8	-24.5	714.8	62.4	27.0
22	022	5	6.305	-0.559	2.998	0.843	0.044	0.588	-90.5	-57.6	718.2	91.1	58.6
23	022	6	6.302	-0.418	3.001	0.849	0.027	0.573	-102.5	-82.2	711.6	102.7	82.3
24	022	7	6.304	-0.279	2.998	0.848	0.042	0.559	-126.1	-94.3	708.5	126.3	95.1
25	022	8	6.307	-0.140	2.995	0.838	0.024	0.532	-137.8	-119.5	698.4	138.2	120.2
26	022	9	6.305	0.000	2.997	0.853	-0.006	0.542	-122.4	-127.5	712.9	122.8	128.0
27	022	10	6.304	0.140	3.001	0.845	-0.039	0.555	-82.0	-112.2	712.8	82.6	113.2
28	022	11	6.303	0.279	3.000	0.870	-0.071	0.557	-82.0	-135.9	720.4	83.9	137.6
29	022	12	6.304	0.420	2.998	0.860	-0.074	0.568	-59.3	-116.1	718.1	59.9	116.6
30	022	13	6.305	0.559	2.997	0.837	-0.086	0.601	3.1	-63.2	722.5	10.4	66.0
31	022	14	6.307	0.700	2.394	0.835	-0.113	0.604	23.7	-63.1	720.7	24.1	63.7
32	022	15	6.307	0.839	2.996	0.811	-0.113	0.631	74.2	-12.1	718.5	74.5	16.1
33	022	16	6.304	0.982	3.001	0.804	-0.089	0.651	85.8	20.5	728.6	90.6	22.6
34	022	17	6.306	1.055	2.997	0.804	-0.099	0.645	87.3	11.2	720.6	87.8	15.2

STOP --

Table 8. Vorticities and Circulations for 37.5° Pitch Angle and X = 6.3

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	1	-0.910	0.550	0.013114	0.000440	0.0335
2	1	-0.770	0.551	0.012919	0.001182	0.0915
3	1	-0.630	0.550	0.013312	0.001309	0.0983
4	1	-0.526	0.550	0.006811	0.000217	0.0318
5	1	-0.456	0.550	0.006960	0.002194	0.3152
6	1	-0.385	0.548	0.007018	-0.011786	-1.6794
7	1	-0.315	0.549	0.007108	0.004178	0.5878

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	2	-0.910	0.650	0.014684	-0.000130	-0.0089
2	2	-0.770	0.650	0.014989	-0.000610	-0.0407
3	2	-0.630	0.650	0.014612	0.000457	0.0313
4	2	-0.526	0.651	0.007302	0.000856	0.1172
5	2	-0.455	0.649	0.007127	0.000163	0.0229
6	2	-0.385	0.649	0.006990	-0.000378	-0.0541
7	2	-0.315	0.650	0.007242	-0.015357	-2.1206
8	2	-0.245	0.650	0.007251	-0.023246	-3.2057
9	2	-0.175	0.651	0.007381	-0.014941	-2.0244
10	2	-0.105	0.651	0.007259	-0.010911	-1.5030
11	2	-0.035	0.651	0.007267	-0.006019	-0.8282
12	2	0.035	0.652	0.007495	-0.008483	-1.1318
13	2	0.105	0.651	0.007203	-0.003760	-0.5219
14	2	0.175	0.650	0.007642	0.003227	0.4223
15	2	0.245	0.650	0.007478	0.013554	1.8126
16	2	0.315	0.650	0.007374	0.009180	1.2449
17	2	0.386	0.651	0.007497	0.009555	1.2745
18	2	0.455	0.651	0.007449	0.013816	1.8548
19	2	0.525	0.650	0.007384	0.009914	1.3426

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	3	-0.910	0.753	0.014039	-0.000670	-0.0477
2	3	-0.770	0.752	0.013506	0.000760	0.0563
3	3	-0.630	0.750	0.013256	0.001046	0.0789
4	3	-0.525	0.750	0.006570	-0.000173	-0.0263
5	3	-0.455	0.748	0.006845	-0.000576	-0.0842
6	3	-0.385	0.748	0.006700	-0.000615	-0.0918
7	3	-0.315	0.749	0.006790	-0.004436	-0.6533
8	3	-0.245	0.750	0.006719	-0.012055	-1.7942
9	3	-0.175	0.750	0.006611	-0.006680	-1.0106
10	3	-0.105	0.750	0.006529	-0.001813	-0.2776
11	3	-0.035	0.750	0.006566	-0.004342	-0.6612
12	3	0.035	0.750	0.006315	-0.004722	-0.7478
13	3	0.105	0.749	0.006494	-0.005312	-0.8181
14	3	0.175	0.751	0.006662	-0.004644	-0.6970
15	3	0.245	0.751	0.006778	-0.007859	-1.1596
16	3	0.315	0.750	0.006657	-0.008498	-1.2766
17	3	0.385	0.751	0.006589	0.001272	0.1930
18	3	0.456	0.751	0.006432	0.006946	1.0799
19	3	0.525	0.751	0.006600	0.002204	0.3340
20	3	0.630	0.751	0.013329	-0.003742	-0.2807
21	3	0.769	0.748	0.012420	-0.002151	-0.1732
22	3	0.910	0.749	0.013654	-0.005039	-0.3691

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	4	-0.910	0.848	0.012649	-0.002125	-0.1680
2	4	-0.770	0.848	0.013489	0.000443	0.0328
3	4	-0.629	0.846	0.013718	0.000408	0.0298
4	4	-0.524	0.845	0.006811	0.000060	0.0088
5	4	-0.454	0.845	0.006768	-0.001598	-0.2361
6	4	-0.385	0.846	0.006821	0.002524	0.3700
7	4	-0.315	0.846	0.006925	0.001387	0.2003
8	4	-0.245	0.847	0.006757	-0.001005	-0.1488
9	4	-0.175	0.848	0.007130	-0.013320	-1.8681
10	4	-0.105	0.848	0.007094	-0.013074	-1.8429
11	4	-0.035	0.847	0.007158	-0.014502	-2.0259
12	4	0.036	0.846	0.006933	-0.007855	-1.1331
13	4	0.104	0.845	0.006850	-0.004050	-0.5912
14	4	0.174	0.845	0.006619	-0.004288	-0.6478
15	4	0.245	0.848	0.006817	0.000996	0.1460
16	4	0.315	0.849	0.007114	0.009601	1.3495
17	4	0.385	0.847	0.006979	0.007176	1.0283
18	4	0.456	0.845	0.006524	-0.002844	-0.4359
19	4	0.525	0.846	0.006453	-0.004899	-0.7592
20	4	0.629	0.847	0.013664	-0.002430	-0.1778
21	4	0.770	0.843	0.014116	0.000528	0.0374
22	4	0.910	0.847	0.014005	0.004543	0.3244

Table 8. Continued

ROW 5: ZC = .95

PT.	YC	GAM	VORTIC
4	-.35	-.0021	-0.1
5	-.21	+.0036	+0.3
6	-.07	-.0050	-0.4
7	+.07	-.0137	-1.0
8	+.21	-.0211	-1.6
9	+.35	-.0222	-1.6
10	+.49	-.014	-1.0

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	6	-1.051	1.049	0.013972	-0.000373	-0.0267
2	6	-0.911	1.048	0.013653	-0.001151	-0.0843
3	6	-0.770	1.047	0.013860	-0.001739	-0.1255
4	6	-0.630	1.047	0.013396	-0.001169	-0.0873
5	6	-0.490	1.047	0.013517	0.003730	0.2759
6	6	-0.351	1.049	0.014168	0.003503	0.2472
7	6	-0.210	1.051	0.014216	-0.013654	-0.9604
8	6	-0.070	1.049	0.013266	-0.020782	-1.5665
9	6	0.070	1.047	0.014238	-0.028005	-1.9670
10	6	0.210	1.046	0.014374	-0.018781	-1.3066
11	6	0.351	1.044	0.014292	-0.006383	-0.4466
12	6	0.491	1.044	0.014771	0.009585	0.6489
13	6	0.630	1.046	0.015516	0.026263	1.6927
14	6	0.771	1.047	0.014789	0.017214	1.1640
15	6	0.910	1.044	0.014511	0.008614	0.5936
16	6	1.018	1.042	0.007863	0.000617	0.0785

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	7	-1.050	1.150	0.014295	0.000343	0.0240
2	7	-0.910	1.149	0.014648	0.000281	0.0192
3	7	-0.769	1.147	0.014580	0.001278	0.0876
4	7	-0.629	1.147	0.014319	0.001560	0.1090
5	7	-0.490	1.147	0.014543	-0.002571	-0.1768
6	7	-0.350	1.150	0.014125	-0.002531	-0.1792
7	7	-0.210	1.150	0.013681	-0.008241	-0.6024
8	7	-0.070	1.148	0.014506	-0.023985	-1.6534
9	7	0.070	1.149	0.014380	-0.034011	-2.3652
10	7	0.210	1.149	0.014289	-0.028662	-2.0059
11	7	0.351	1.147	0.014837	-0.028537	-1.9234
12	7	0.491	1.148	0.014289	-0.018735	-1.3112
13	7	0.630	1.151	0.014122	-0.008389	-0.5940
14	7	0.771	1.149	0.013925	-0.000899	-0.0646
15	7	0.911	1.147	0.014380	-0.002087	-0.1451
16	7	1.018	1.146	0.007693	0.000384	0.0500

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	8	-1.050	1.251	0.013784	0.000269	0.0195
2	8	-0.910	1.250	0.013847	-0.000518	-0.0374
3	8	-0.770	1.249	0.013995	0.000056	0.0040
4	8	-0.630	1.248	0.013732	-0.001093	-0.0796
5	8	-0.490	1.248	0.013691	-0.000579	-0.0423
6	8	-0.350	1.251	0.014309	-0.009426	-0.6587
7	8	-0.210	1.251	0.014449	-0.015745	-1.0897
8	8	-0.070	1.251	0.014319	-0.019521	-1.3633
9	8	0.070	1.249	0.013789	-0.046879	-3.3998
10	8	0.210	1.249	0.013565	-0.046302	-3.4134
11	8	0.350	1.250	0.013991	-0.022719	-1.6238
12	8	0.491	1.250	0.014133	-0.000487	-0.0345
13	8	0.630	1.250	0.013616	0.001919	0.1409
14	8	0.770	1.247	0.013347	-0.007867	-0.5895
15	8	0.911	1.248	0.013878	-0.009215	-0.6640
16	8	1.018	1.250	0.007857	-0.004126	-0.5261

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	9	-1.050	1.348	0.013620	-0.000616	-0.0452
2	9	-0.910	1.349	0.013641	-0.000251	-0.0184
3	9	-0.770	1.348	0.013777	0.000319	0.0232
4	9	-0.630	1.348	0.014357	0.001332	0.0927
5	9	-0.490	1.348	0.014110	0.001451	0.1028
6	9	-0.350	1.350	0.013531	0.002546	0.1882
7	9	-0.210	1.350	0.013165	0.007564	0.5745
8	9	-0.069	1.349	0.013161	0.010385	0.7890
9	9	0.070	1.349	0.013836	0.015966	1.1539
10	9	0.210	1.347	0.013958	0.011464	0.8206
11	9	0.350	1.347	0.013237	0.004463	0.3372
12	9	0.490	1.348	0.013294	0.001512	0.1137
13	9	0.630	1.347	0.013574	-0.003343	-0.2463
14	9	0.770	1.346	0.014657	0.009058	0.6180
15	9	0.911	1.348	0.013951	0.024203	1.7348
16	9	1.018	1.350	0.007133	0.009378	1.3147

ROW 10: ZC = 1.45

PT.	YC	GAM	VORTIC
7	-.21	.0052	.32
8	-.07	-.0159	-1.12
9	.07	-.0144	-1.01
10	.21	-.0026	-.19
11	.35	-.0036	-.26
12	.49	+.0030	+.22
13	.63	+.0128	.90
14	.77	-.0009	-.07
15	.91	-.014	-1.0

Table 8. Concluded

ROW 11: ZC = 1.60

PT.	YC	GAM	VORTIC
9	.07	.0067	.24
10	.21	.004	.14
11	.35	.0080	.29
12	.49	.0039	.14
13	.63	.0109	.39
14	.77	.0242	.85
15	.91	.0269	.96

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	12	-1.050	1.749	0.013417	0.000487	0.0363
2	12	-0.910	1.748	0.012899	0.000386	0.0299
3	12	-0.771	1.748	0.013211	-0.000837	-0.0634
4	12	-0.630	1.748	0.014130	-0.001261	-0.0893
5	12	-0.490	1.748	0.013745	-0.002724	-0.1982
6	12	-0.350	1.748	0.014130	-0.000768	-0.0543
7	12	-0.210	1.749	0.013869	-0.002884	-0.2080
8	12	-0.070	1.748	0.013782	-0.015513	-1.1256
9	12	0.070	1.750	0.013586	-0.016719	-1.2306
10	12	0.209	1.751	0.013796	0.006092	0.4416
11	12	0.350	1.750	0.013703	0.019209	1.4019
12	12	0.491	1.749	0.014332	0.020134	1.4048
13	12	0.631	1.748	0.013776	0.017082	1.2400
14	12	0.770	1.749	0.013404	0.011106	0.8285
15	12	0.909	1.747	0.013914	-0.004266	-0.3066
16	12	1.017	1.745	0.007665	-0.006693	-0.8731

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	13	-1.050	1.900	0.028952	-0.004052	-0.1399
2	13	-0.910	1.898	0.029030	-0.000858	-0.0295
3	13	-0.770	1.899	0.028940	-0.001058	-0.0366
4	13	-0.630	1.900	0.028696	0.001169	0.0407
5	13	-0.491	1.899	0.028222	-0.001672	-0.0592
6	13	-0.351	1.900	0.028865	0.003094	0.1072
7	13	-0.210	1.900	0.028081	0.003630	0.1293
8	13	-0.070	1.899	0.028922	0.020478	0.7081
9	13	0.070	1.901	0.028158	0.012157	0.4317
10	13	0.209	1.902	0.028507	0.018351	0.6437
11	13	0.349	1.901	0.028697	0.023831	0.8304
12	13	0.491	1.902	0.029216	0.033281	1.1391
13	13	0.631	1.901	0.028394	0.040314	1.4198
14	13	0.770	1.901	0.029107	0.023067	0.7925
15	13	0.910	1.901	0.028940	0.012330	0.4260
16	13	1.017	1.899	0.015621	0.002219	0.1420

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	14	-1.051	2.249	0.069832	-0.002523	-0.0361
2	14	-0.911	2.251	0.068756	0.000793	0.0115
3	14	-0.771	2.251	0.070672	-0.000412	-0.0058
4	14	-0.629	2.250	0.069706	-0.002852	-0.0409
5	14	-0.490	2.250	0.068714	-0.003420	-0.0498
6	14	-0.350	2.251	0.070533	-0.001162	-0.0165
7	14	-0.210	2.251	0.069395	-0.001627	-0.0235
8	14	-0.071	2.250	0.069333	-0.004998	-0.0721
9	14	0.069	2.251	0.069866	0.007788	0.1115
10	14	0.210	2.251	0.070209	0.036870	0.5251
11	14	0.350	2.251	0.069148	0.053439	0.7728
12	14	0.490	2.251	0.069356	0.051613	0.7442
13	14	0.630	2.251	0.069073	0.024734	0.3581
14	14	0.770	2.252	0.069393	0.015322	0.2208
15	14	0.910	2.252	0.069190	0.007114	0.1028
16	14	1.017	2.251	0.037146	0.000615	0.0166

VORTICITY AND CIRCULATION

POINT	ROW	YC	ZC	AREA	GAM	VORTIC
1	15	-1.051	2.746	0.069410	0.000666	0.0096
2	15	-0.911	2.748	0.069539	-0.002331	-0.0335
3	15	-0.771	2.750	0.070647	0.001811	0.0256
4	15	-0.629	2.748	0.070435	-0.001794	-0.0255
5	15	-0.489	2.749	0.069895	0.000410	0.0059
6	15	-0.349	2.750	0.070042	-0.000337	-0.0048
7	15	-0.210	2.749	0.068784	-0.002442	-0.0355
8	15	-0.071	2.748	0.069407	-0.002327	-0.0335
9	15	0.070	2.749	0.070362	-0.000358	-0.0050
10	15	0.210	2.750	0.070118	0.001335	0.0190
11	15	0.350	2.749	0.069933	0.005699	0.0815
12	15	0.490	2.748	0.069417	0.003298	0.0475
13	15	0.630	2.746	0.070504	-0.000892	-0.0127
14	15	0.770	2.748	0.068879	0.001090	0.0158
15	15	0.910	2.749	0.070419	0.003811	0.0541
16	15	1.018	2.748	0.036890	-0.002671	-0.0724

STOP --

Table 9. Summary of Vortex Data

α	22.5	37.5		
X	6.3	2.8	4.9	6.3
First vortex originating from -Y side:				
ZC from velocity vectors	0.572	----	0.687	----
YC from velocity vectors	-0.107	----	-0.010	----
ZC using vorticity values	----	0.61	----	0.99
YC using vorticity values	----	-0.17	----	0.28
Γ on -Y side of $\Omega = 0$	-0.356	-0.151	-0.604	----
Γ inside $\Omega = -1$ contour	-0.28	----	-0.35	-0.41
Γ inside $\Omega = -0.5$ contour	----	-0.169	----	----
First vortex originating from +Y side:				
ZC from velocity vectors	0.677	0.680	----	----
YC from velocity vectors	0.171	0.216	----	----
ZC using vorticity values	----	----	1.05	2.20
YC using vorticity values	----	----	0.35	1.15
Γ on +Y side of $\Omega = 0$	0.339	0.291	0.53	----
Γ inside $\Omega = +1$ contour	0.298	----	----	----
Γ inside $\Omega = +0.5$ contour	----	0.306	0.44	----
Γ inside $\Omega = +0.2$ contour	----	----	----	0.51

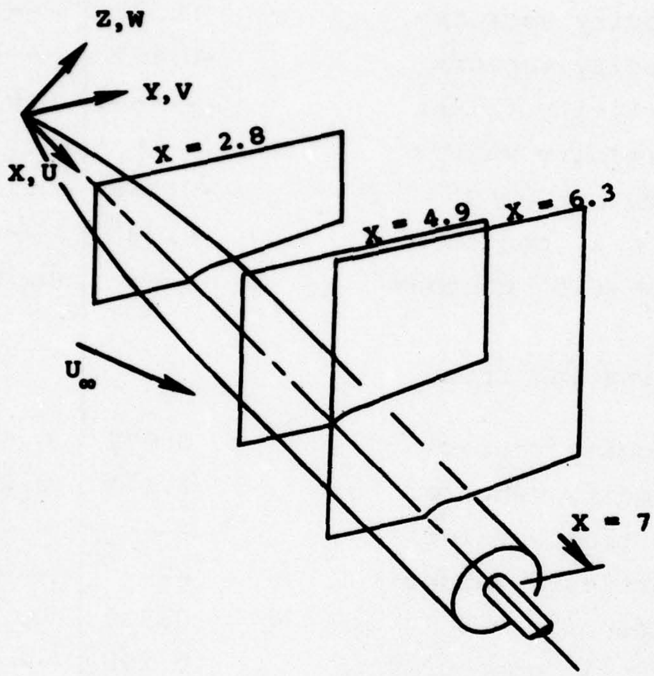


Figure 1.- Test model, coordinate system, and measurement planes.

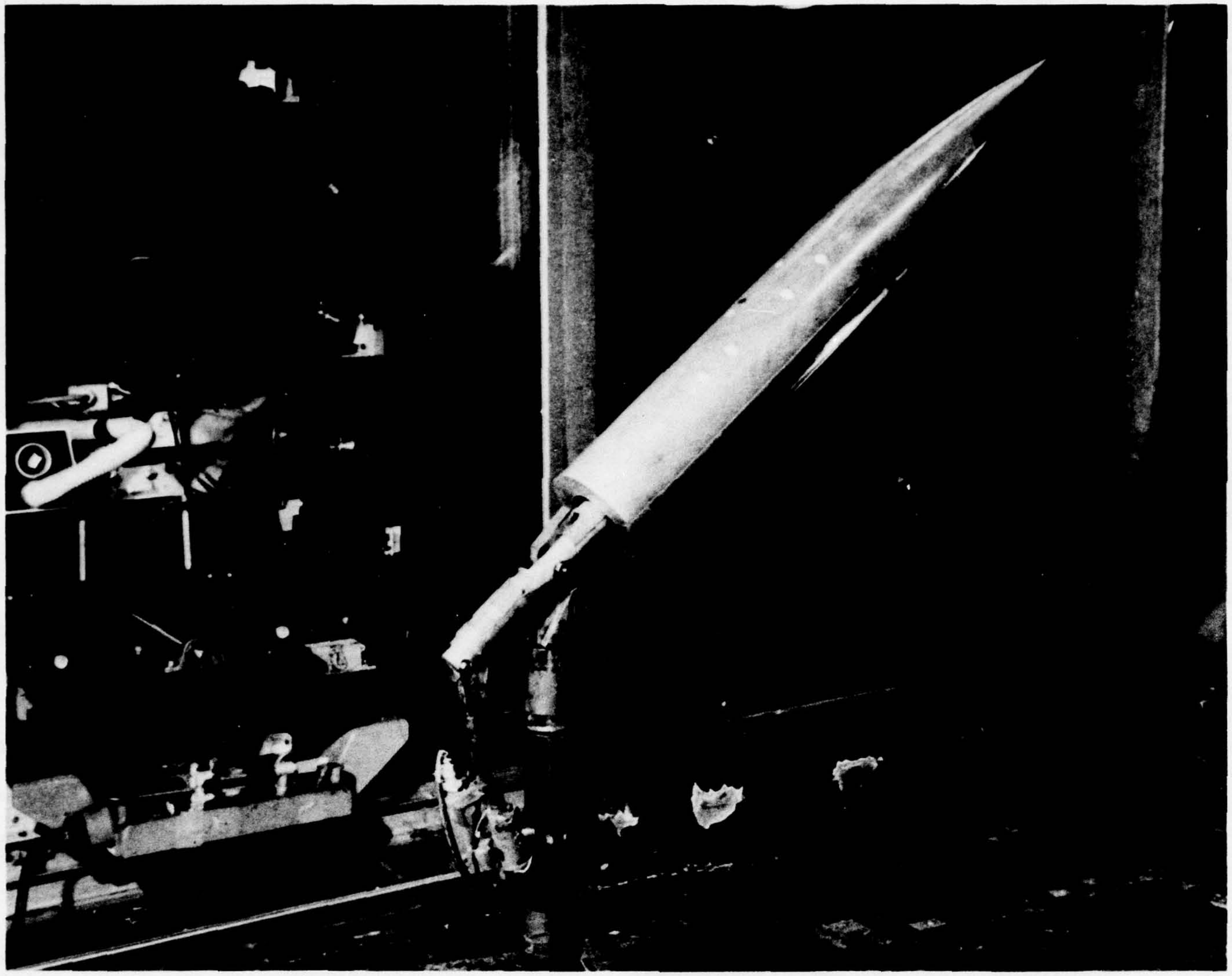


Figure 2.- Model mounted in the wind tunnel. Laser velocimeter system is seen through the window.

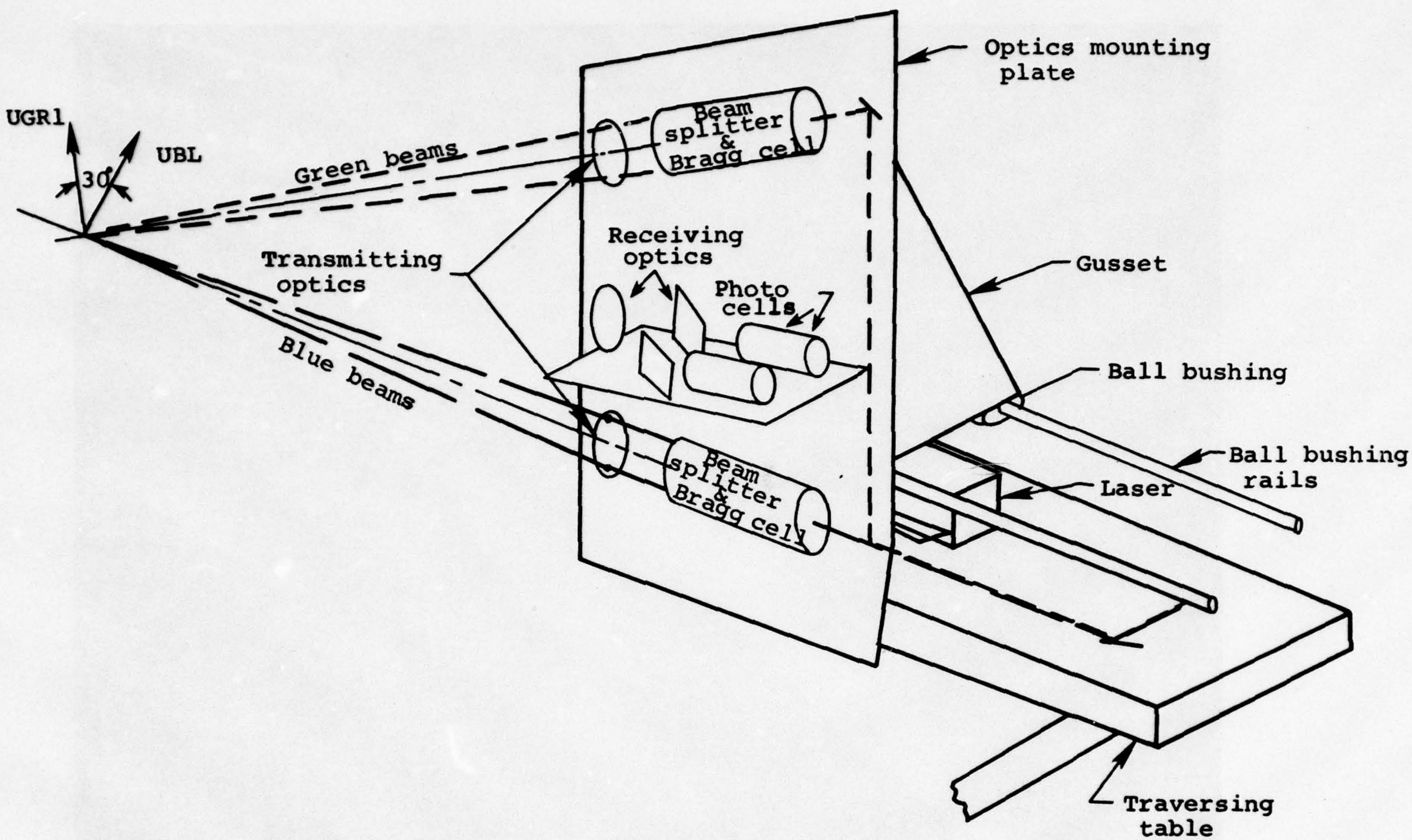


Figure 3.- Crossflow laser velocimeter.

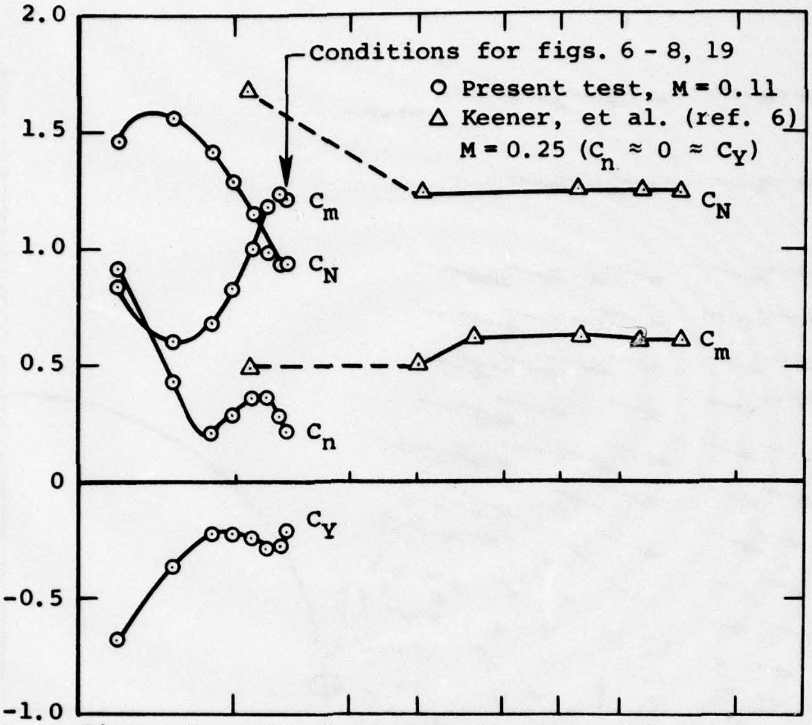


Figure 4.- Effect of crossflow Reynolds number on body forces and moments for 22.5° pitch angle.

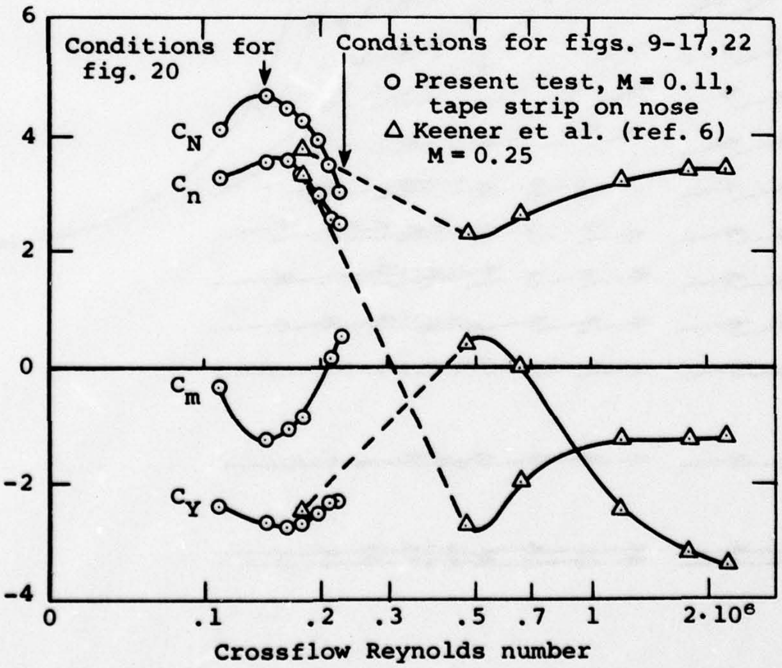


Figure 5.- Effect of crossflow Reynolds number on body forces and moments for 37.5° pitch angle.

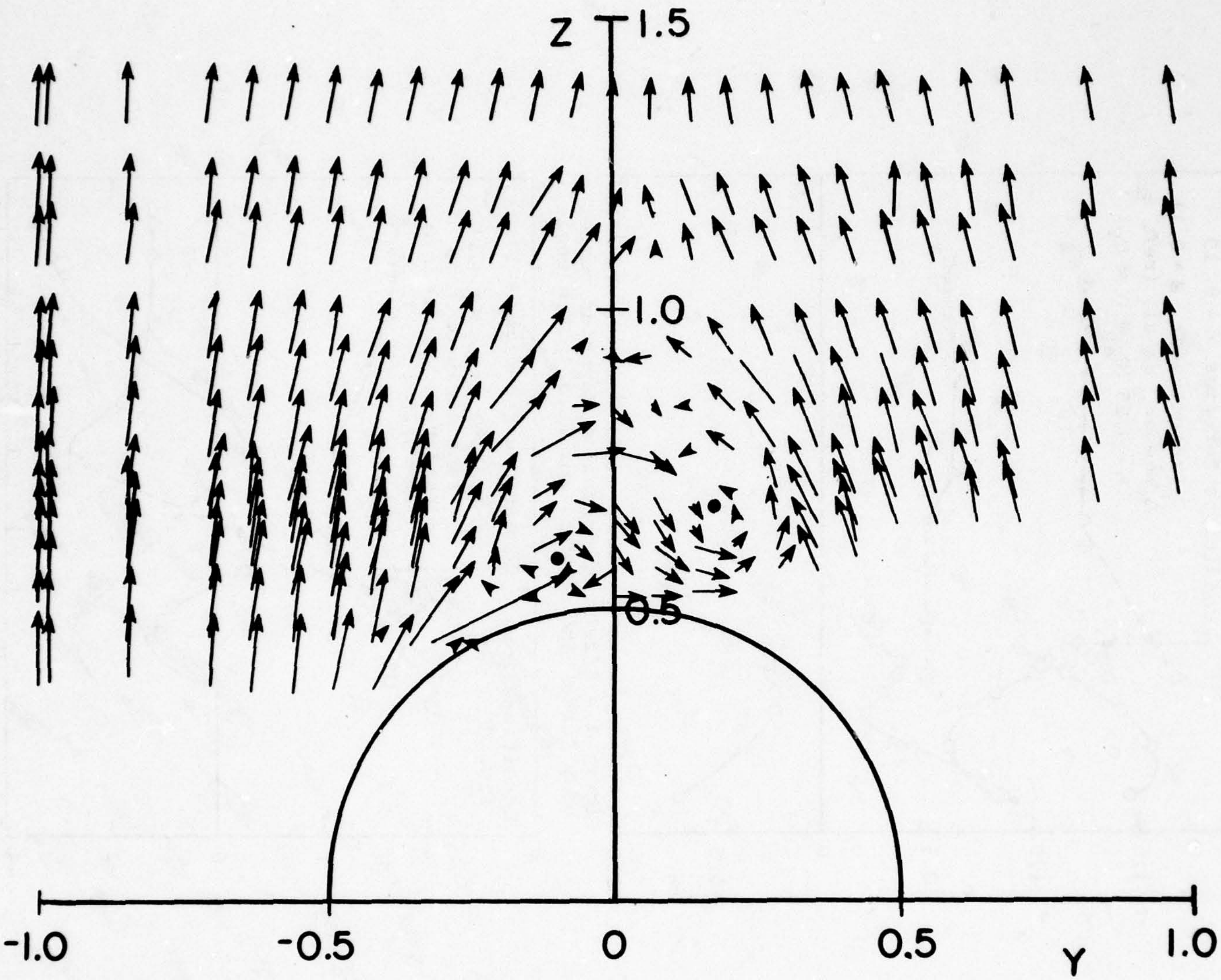


Figure 6.- Crossflow vectors at $X = 6.3$, for $\alpha = 22.5^\circ$.

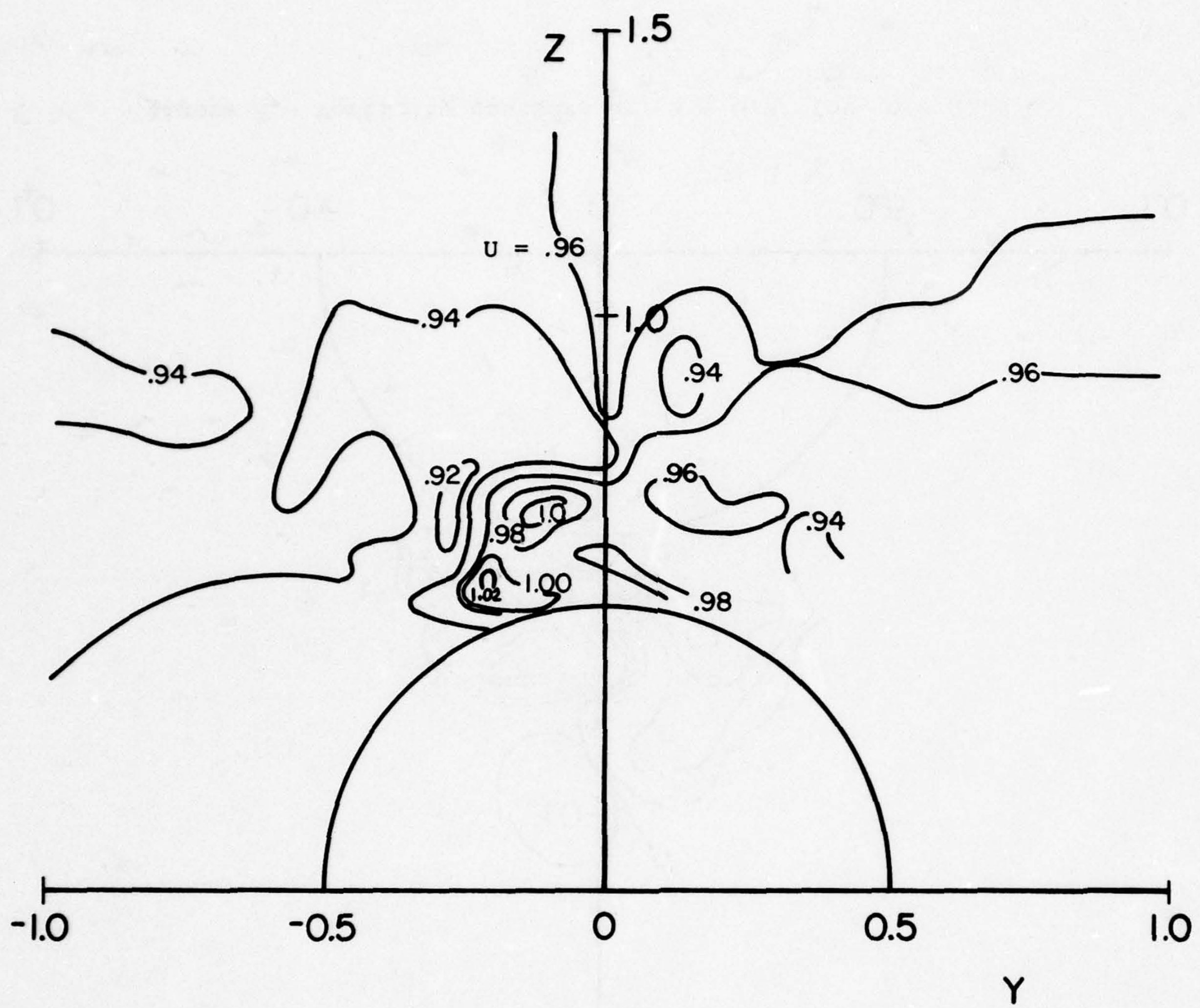


Figure 7.- Axial velocity contours at X = 6.3 for α = 22.5°.

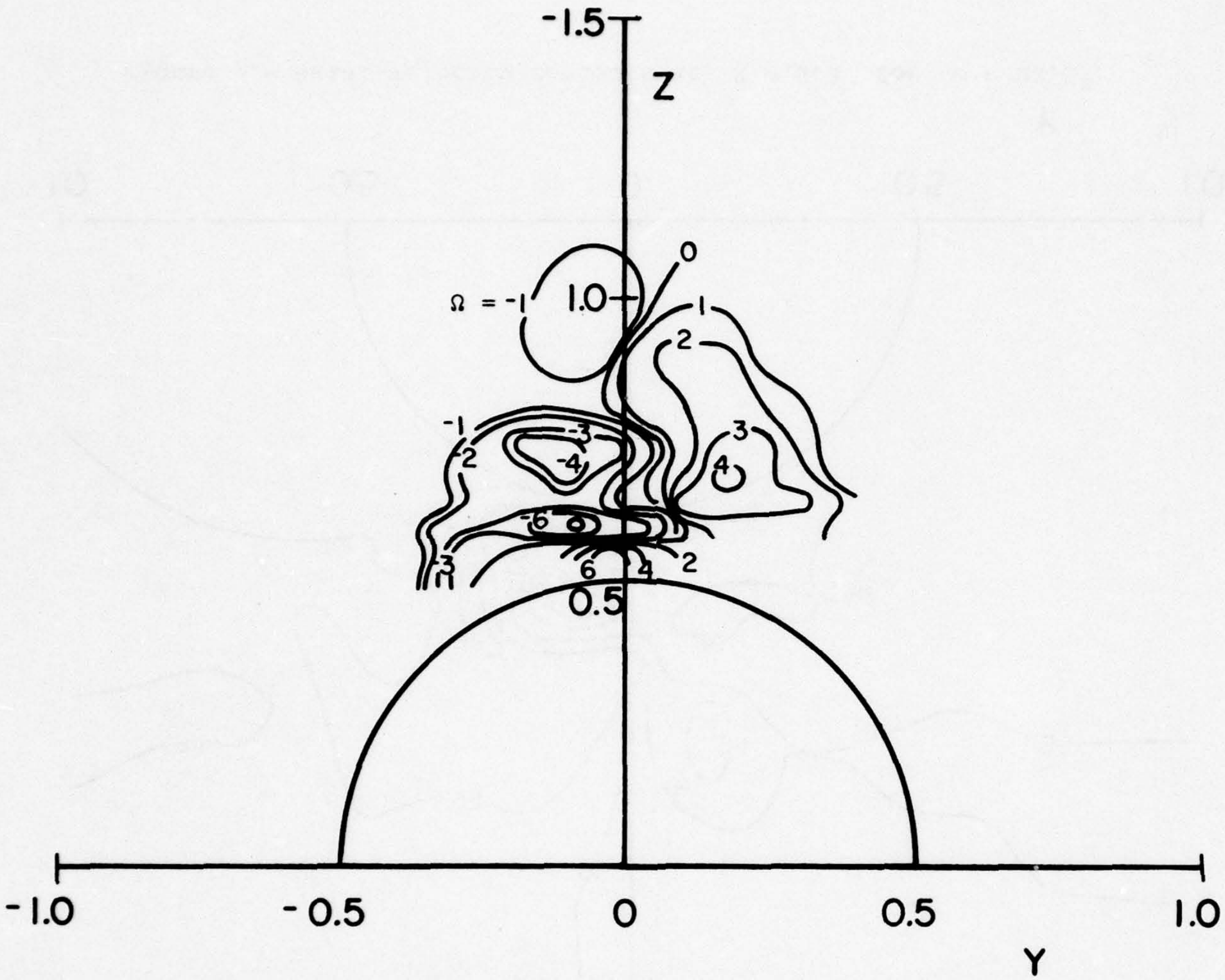


Figure 8.- Vorticity contours at X = 6.3 for α = 22.5°.

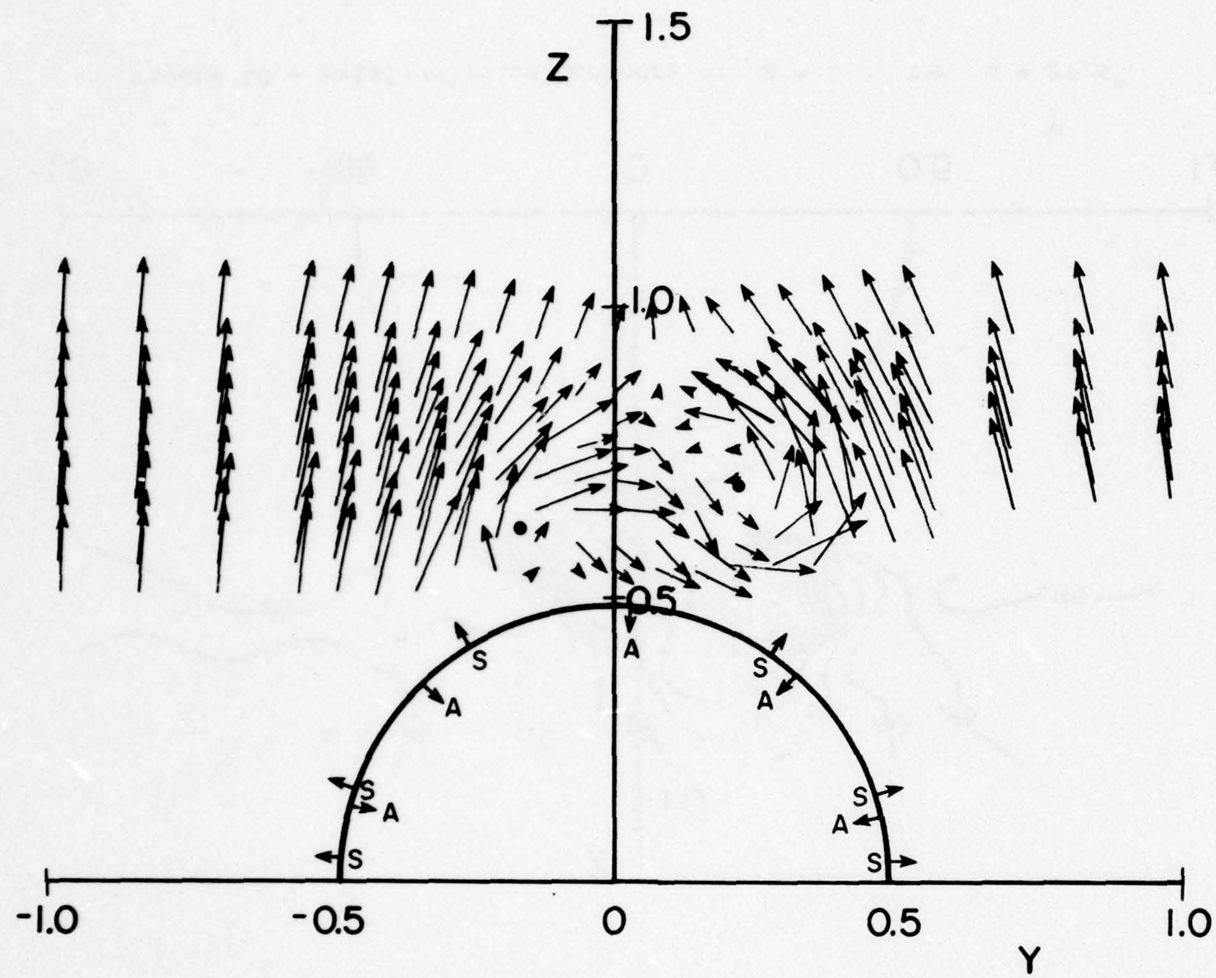


Figure 9.- Crossflow vectors at $X = 2.8$ for $\alpha = 37.5^{o}$.

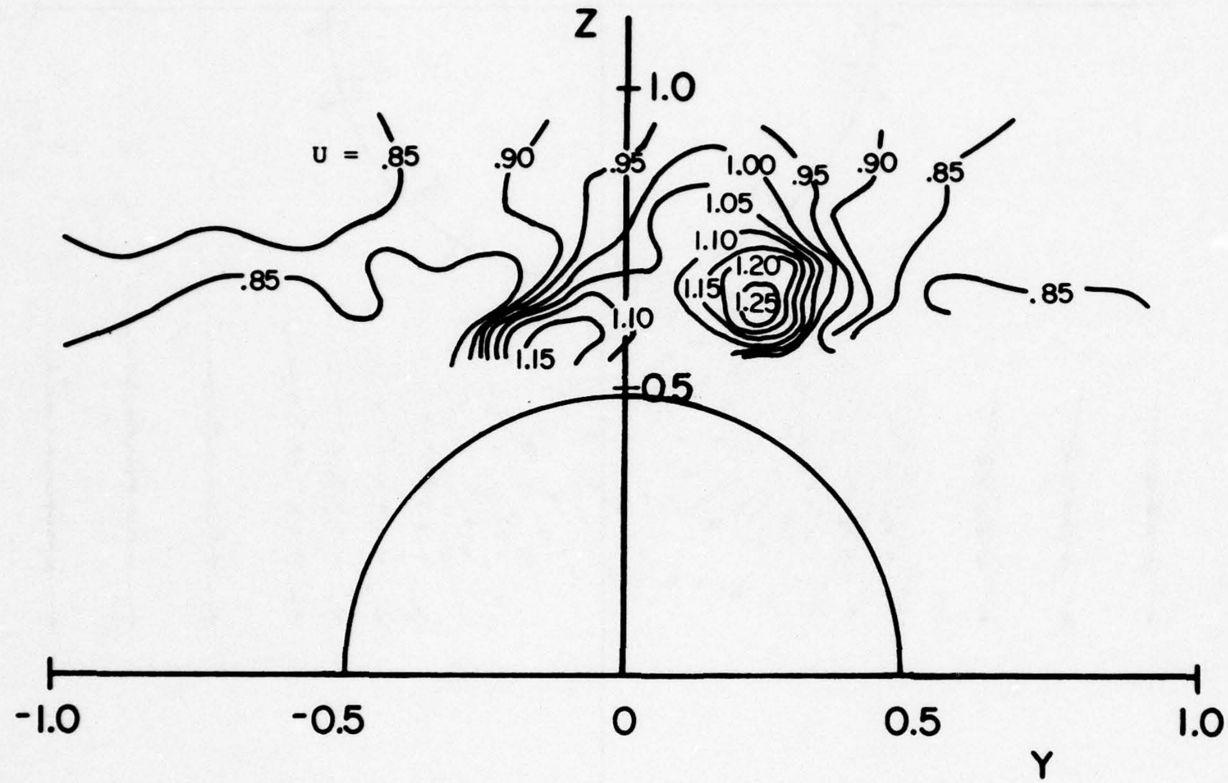


Figure 10.- Axial velocity contours at $X = 2.8$ for $\alpha = 37.5^{\circ}$.

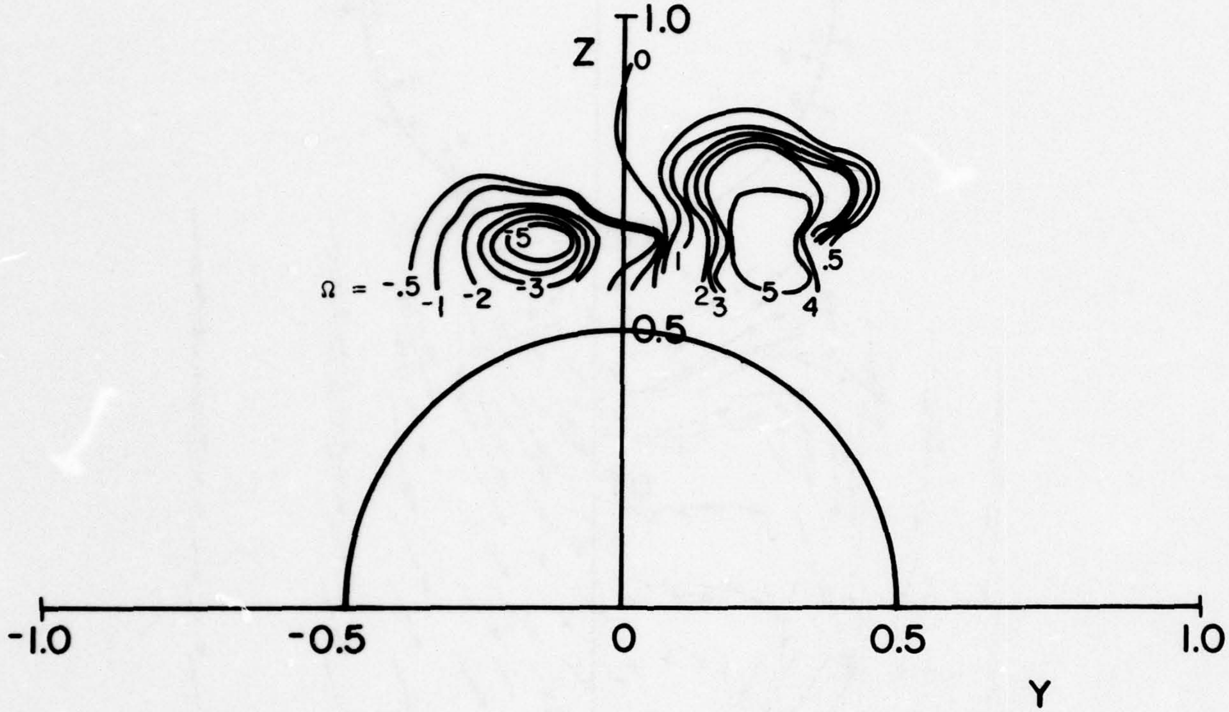


Figure 11.- Vorticity contours at X = 2.8 for $\alpha = 37.5^{\circ}$.

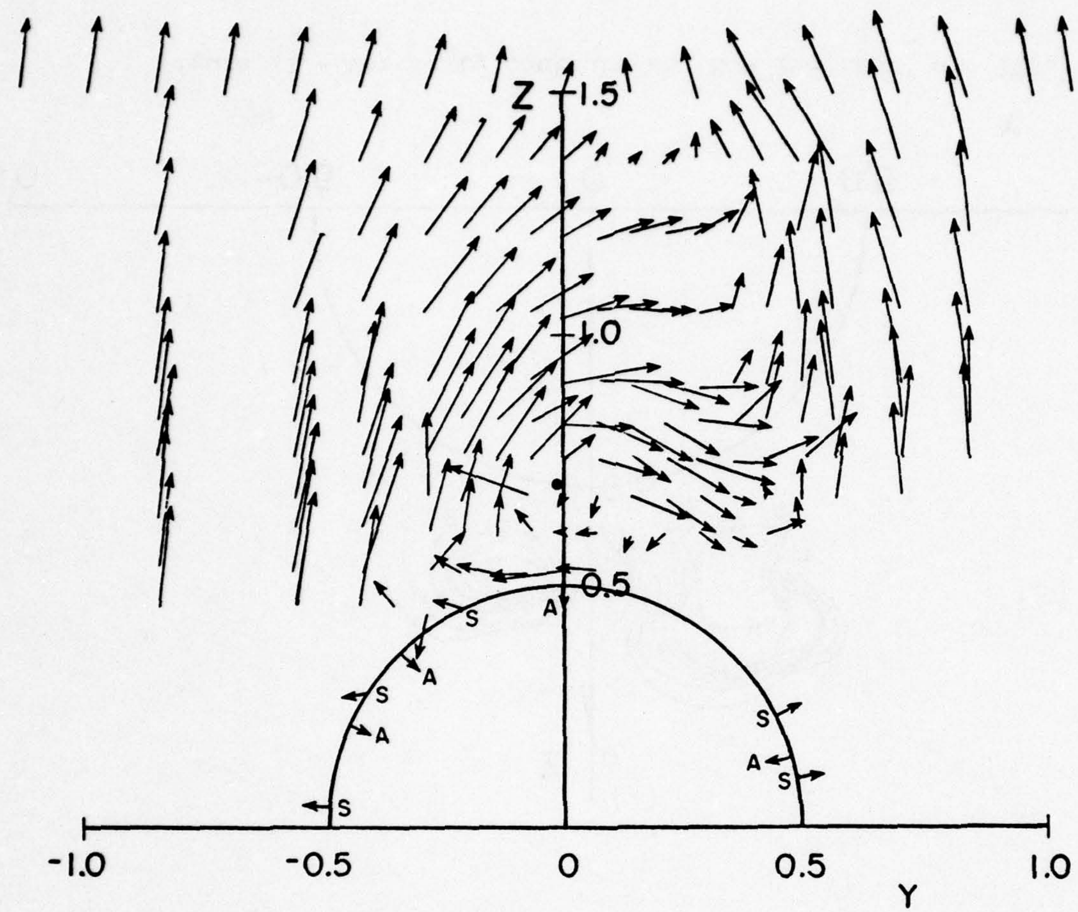


Figure 12.- Crossflow vectors at $X = 4.9$ for $\alpha = 37.5^o$.

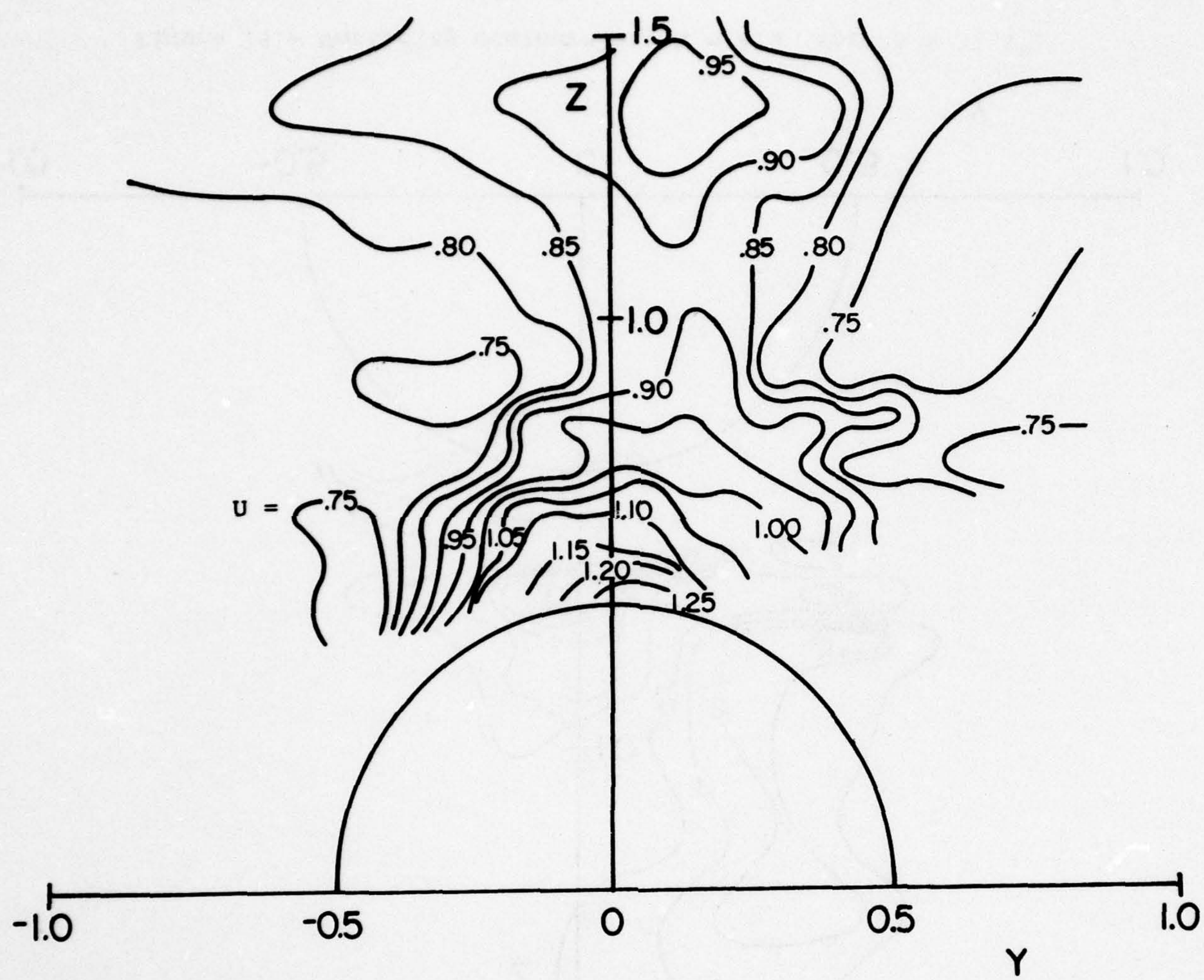


Figure 13.- Axial velocity contours at X = 4.9 for $\alpha = 37.5^{\circ}$.

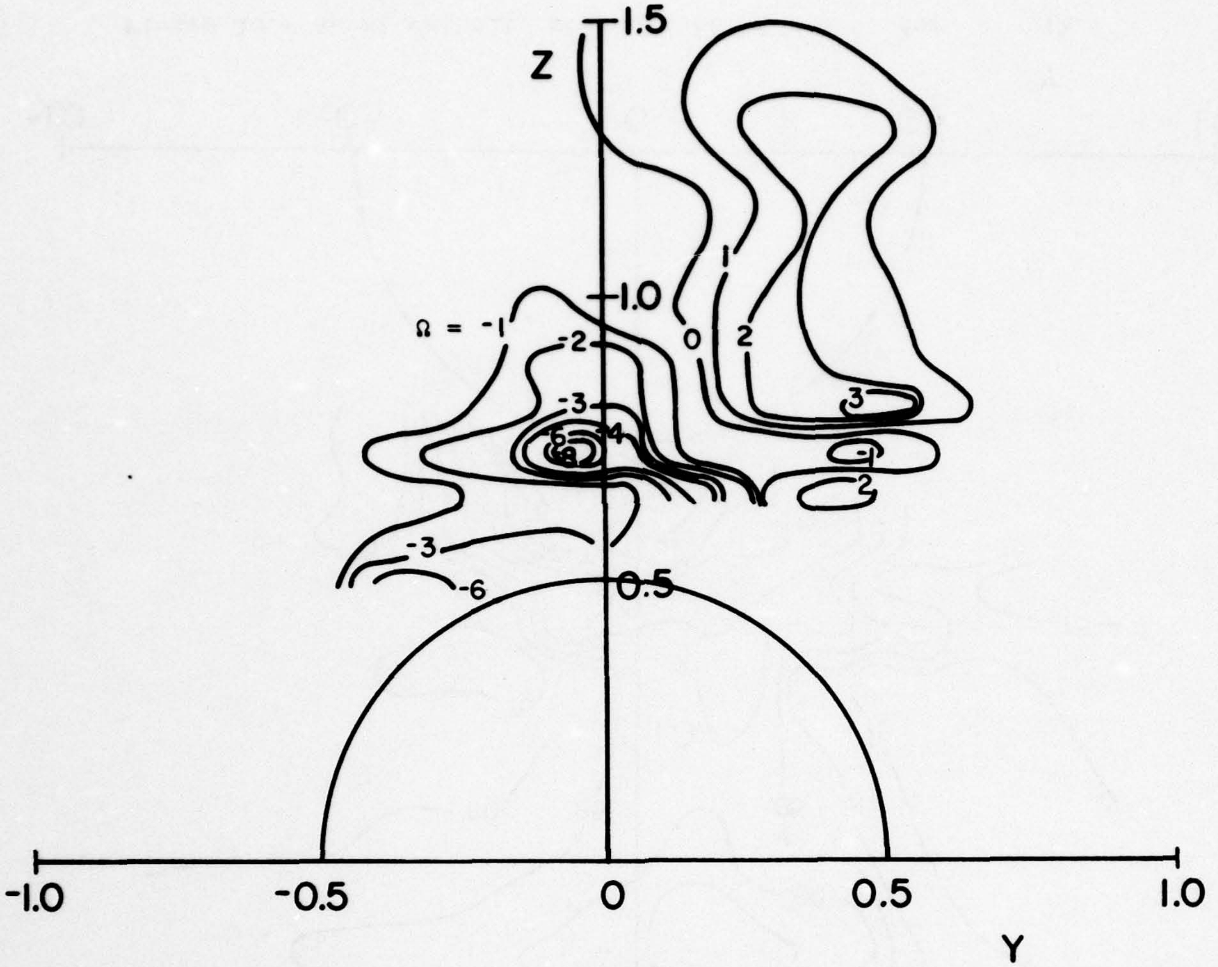


Figure 14.- Vorticity contours at X = 4.9 for α = 37.5°.

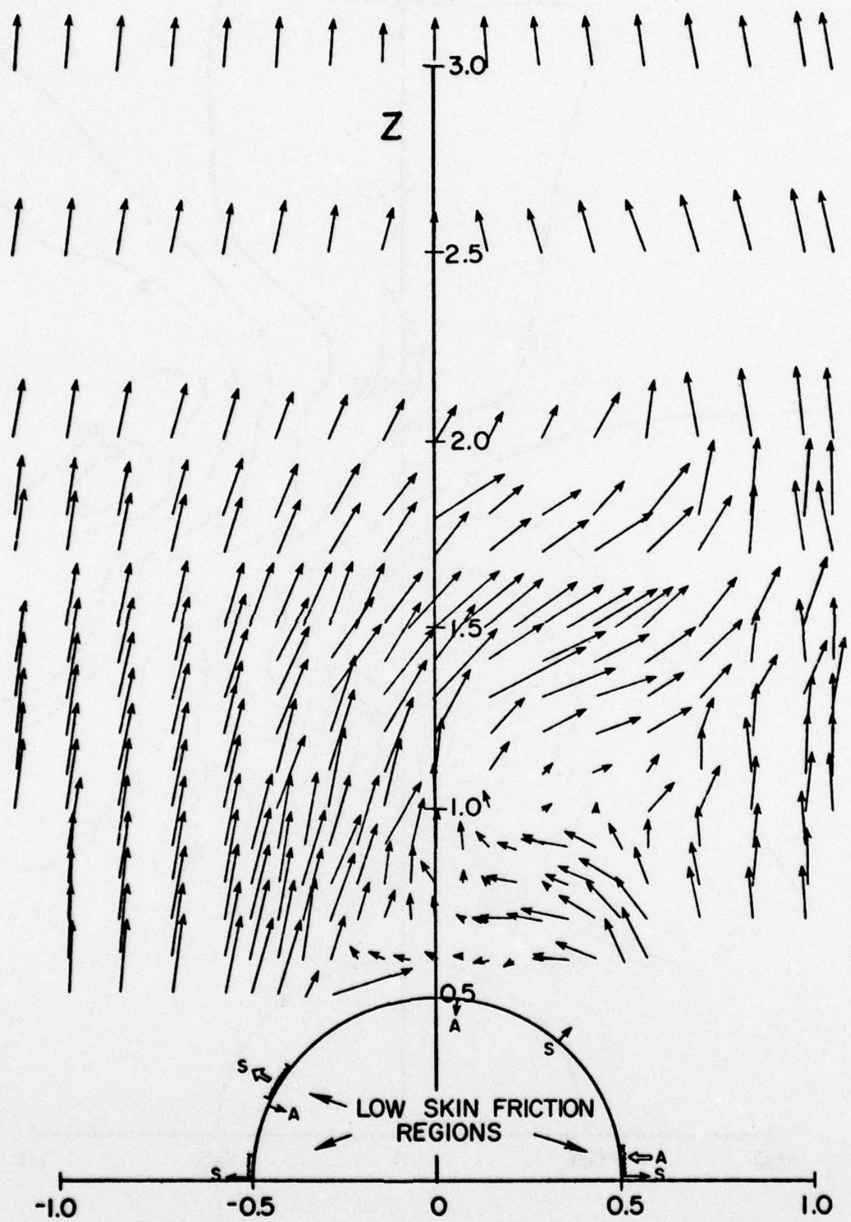


Figure 15.- Crossflow velocity vectors at X = 6.3 for $\alpha = 37.5^{\circ}$.

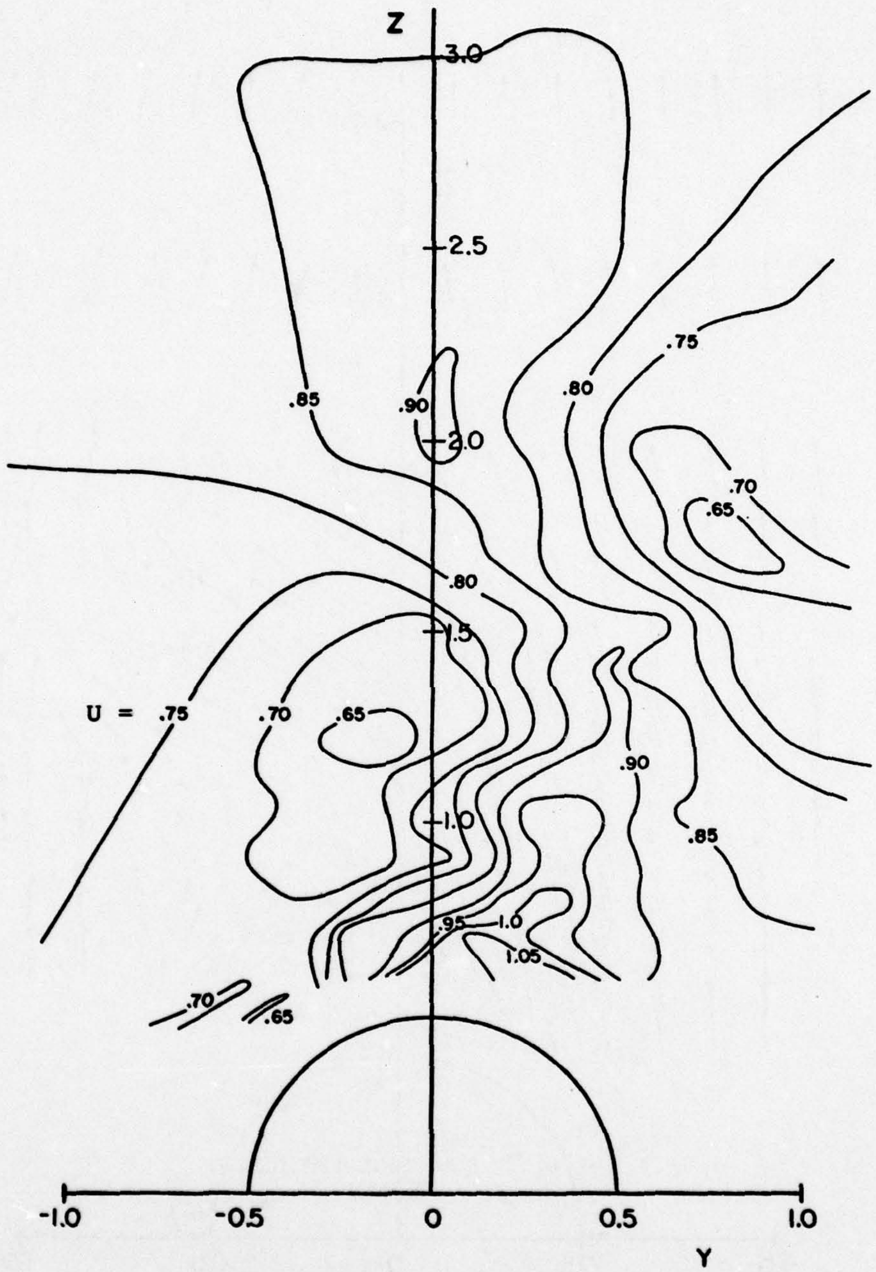


Figure 16.- Axial velocity contours at X = 6.3 for $\alpha = 37.5^{o}$.

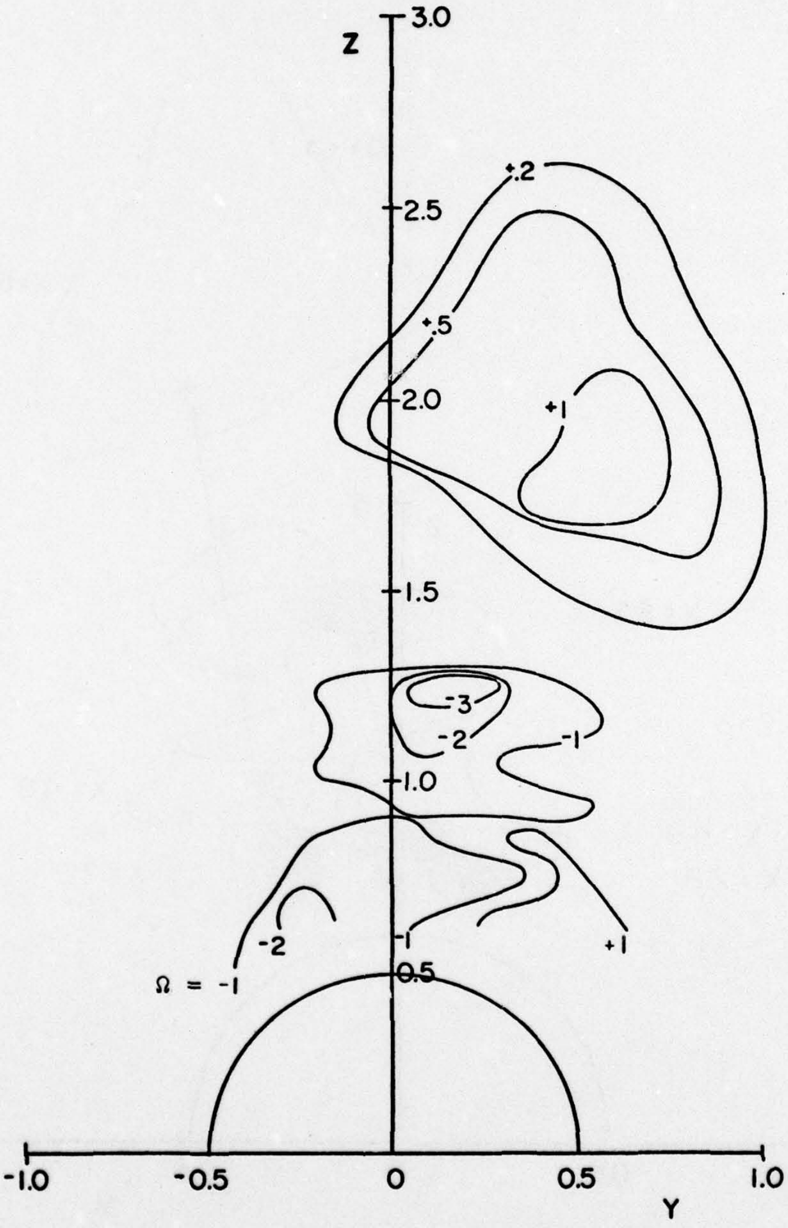


Figure 17.- Vorticity contours at
X = 6.3 for $\alpha = 37.5^{\circ}$.

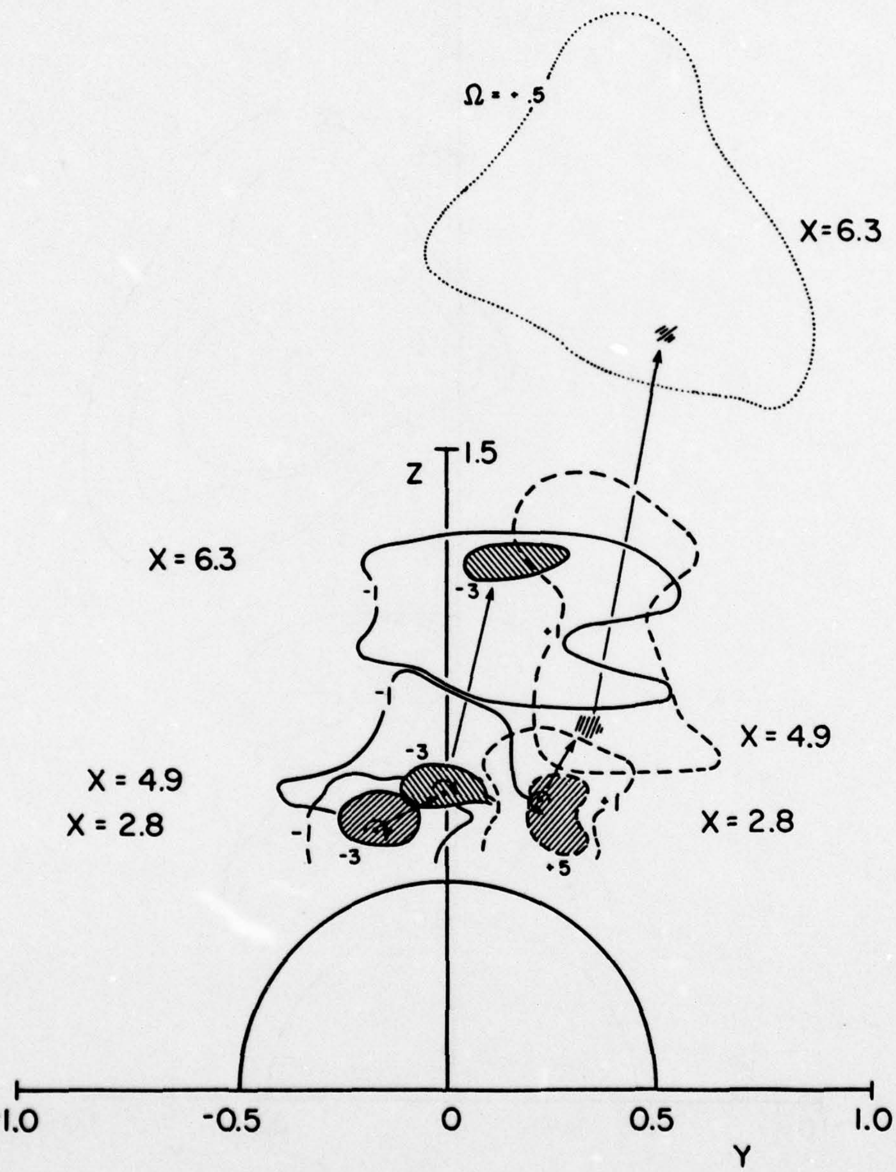
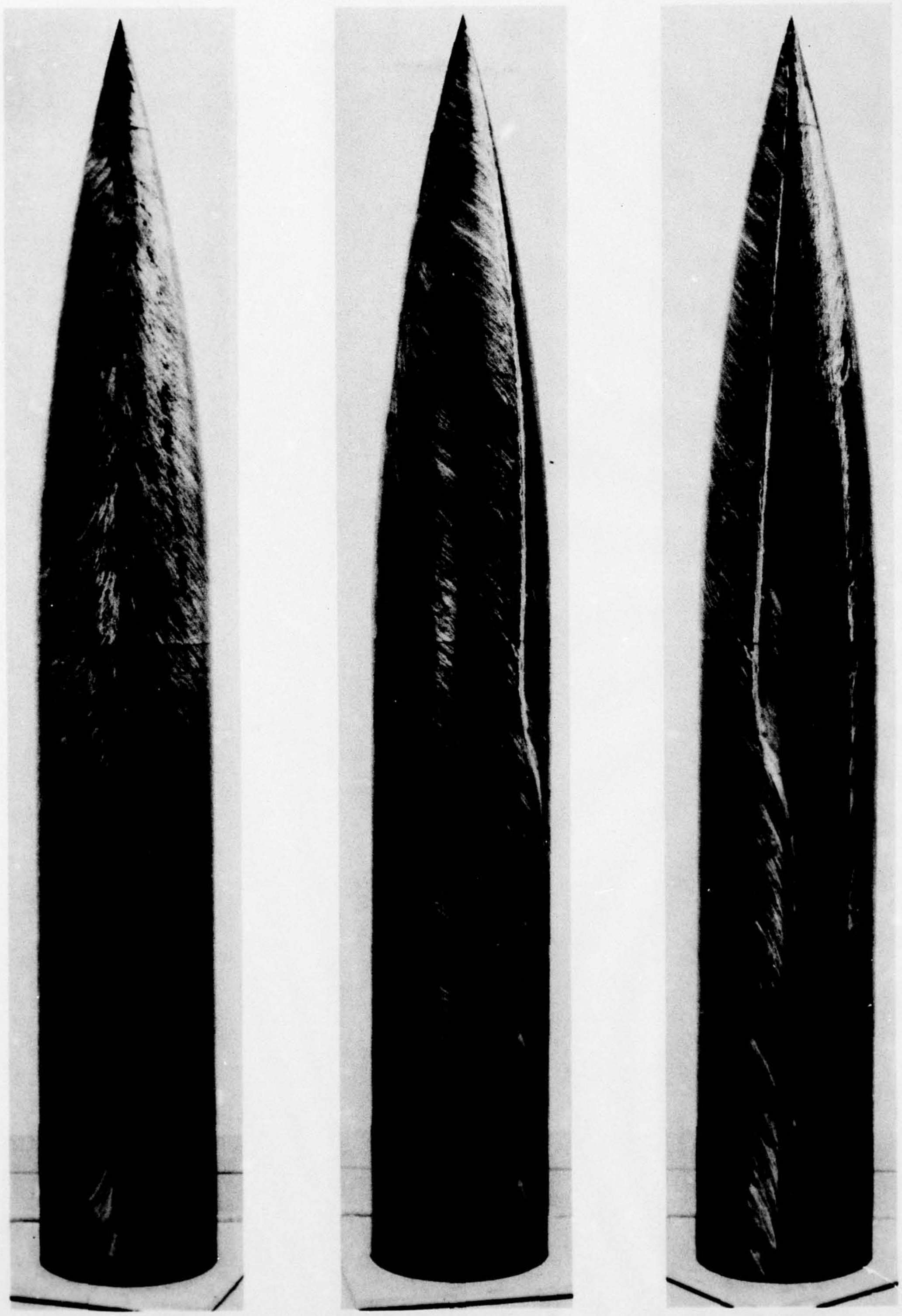
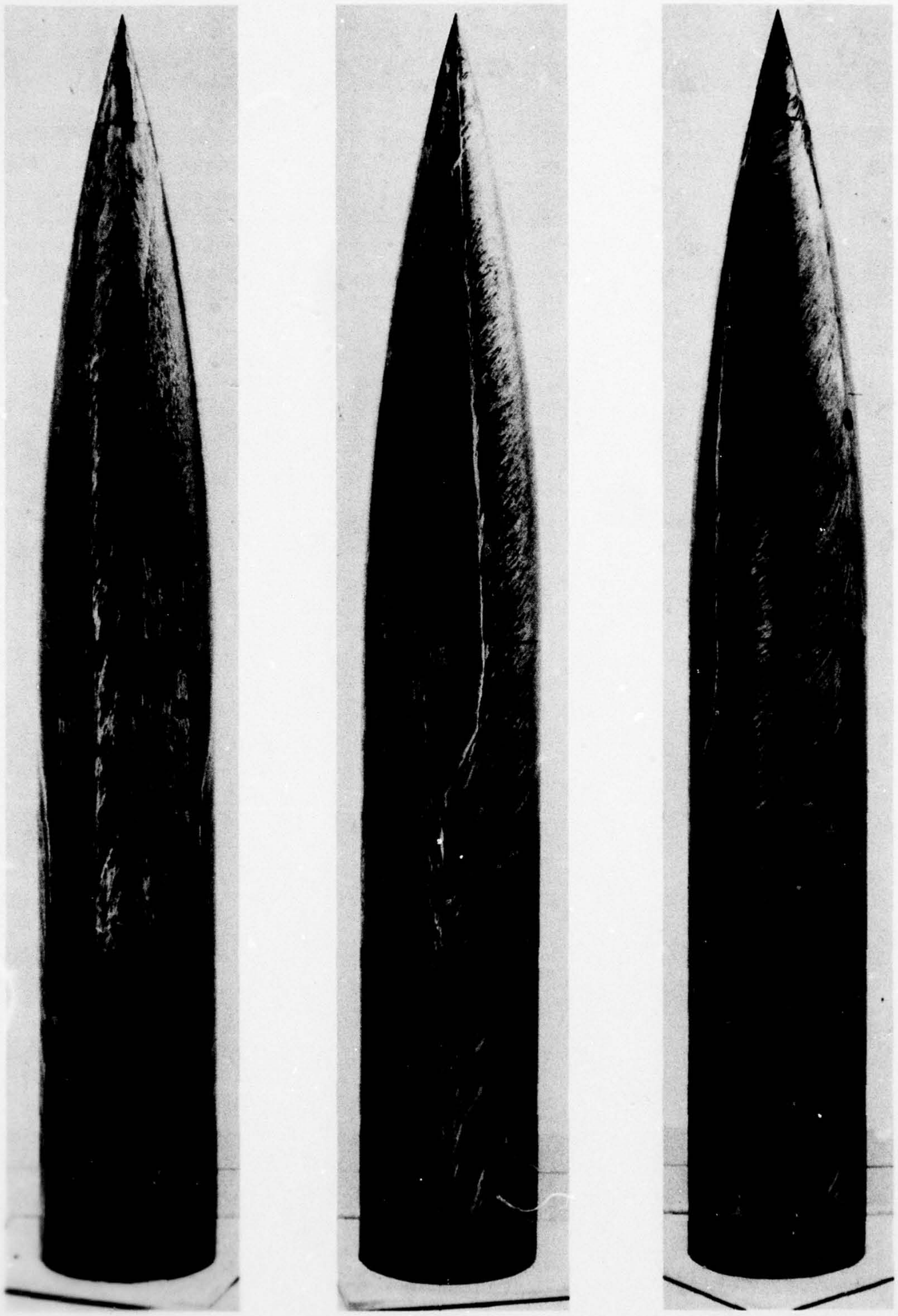


Figure 18.- Summary of vorticity contours at $\alpha = 37.5^{\circ}$.



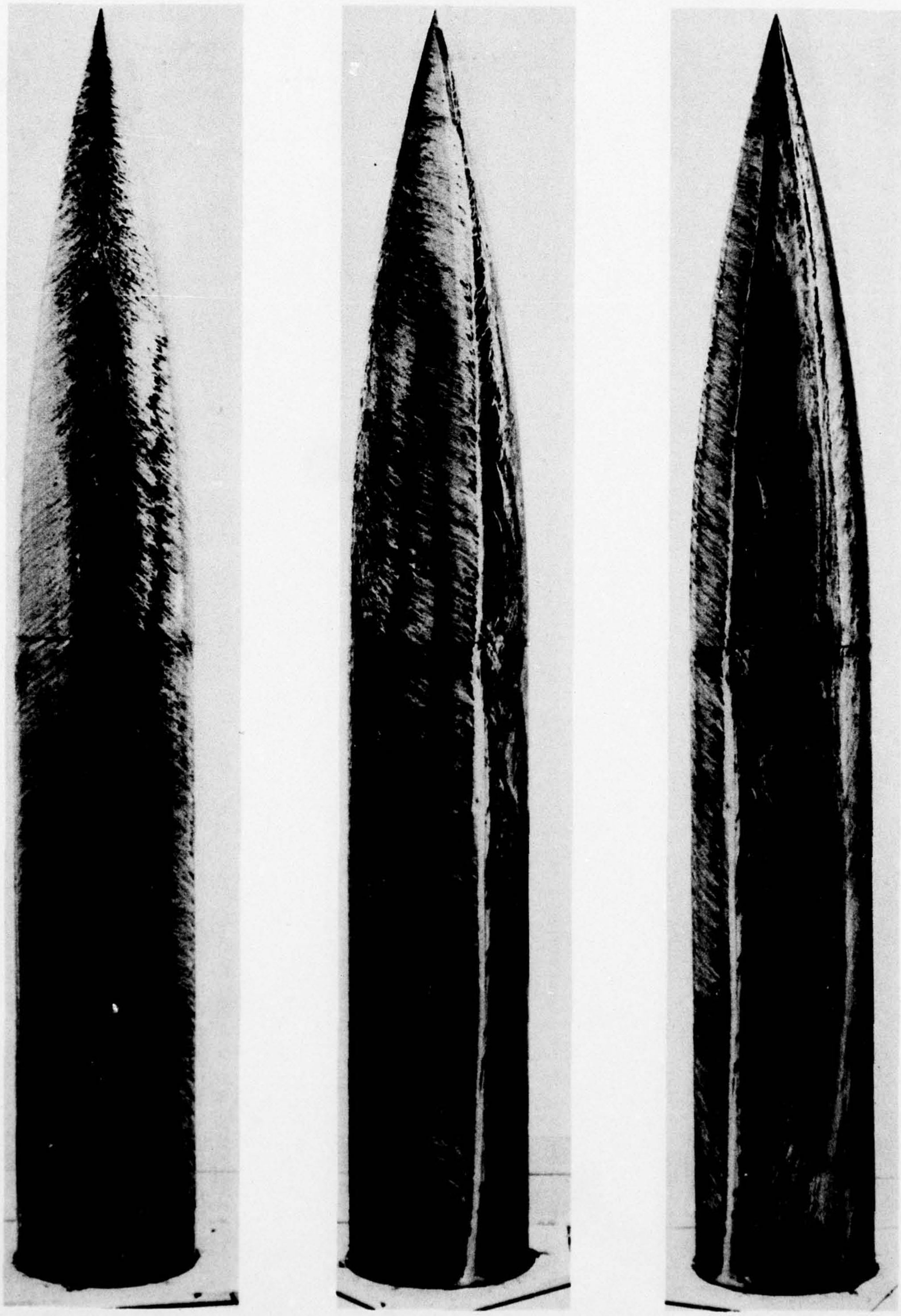
$\theta = 0^{\circ}$ 60° 120°

Figure 19.- Carbon black surface flow visualization, $\alpha = 22\text{-}1/2^{\circ}$; $Re_D = 0.37 \cdot 10^6$.



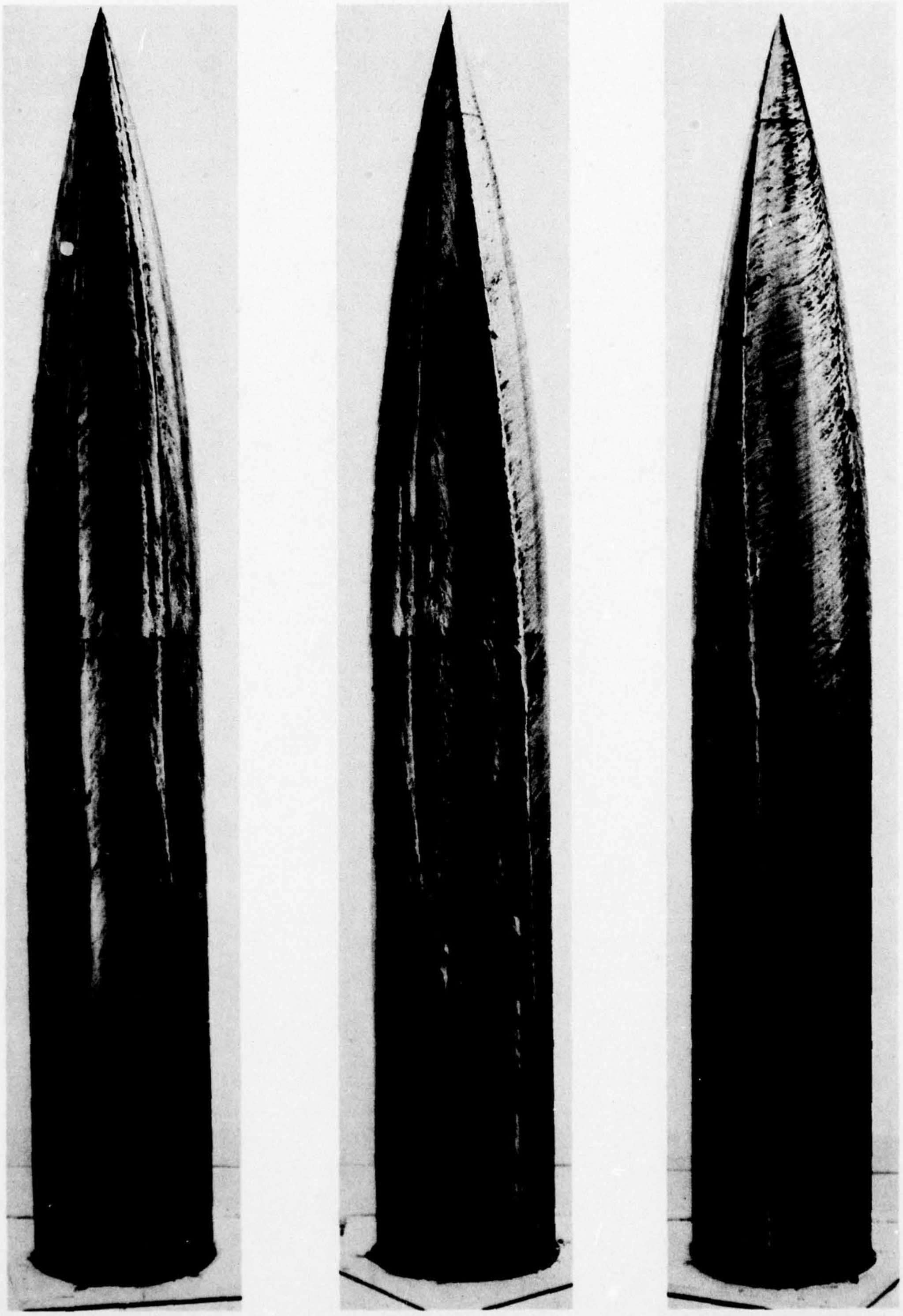
$\theta = 180^{\circ}$ 240° 300°

Figure 19.- Concluded.



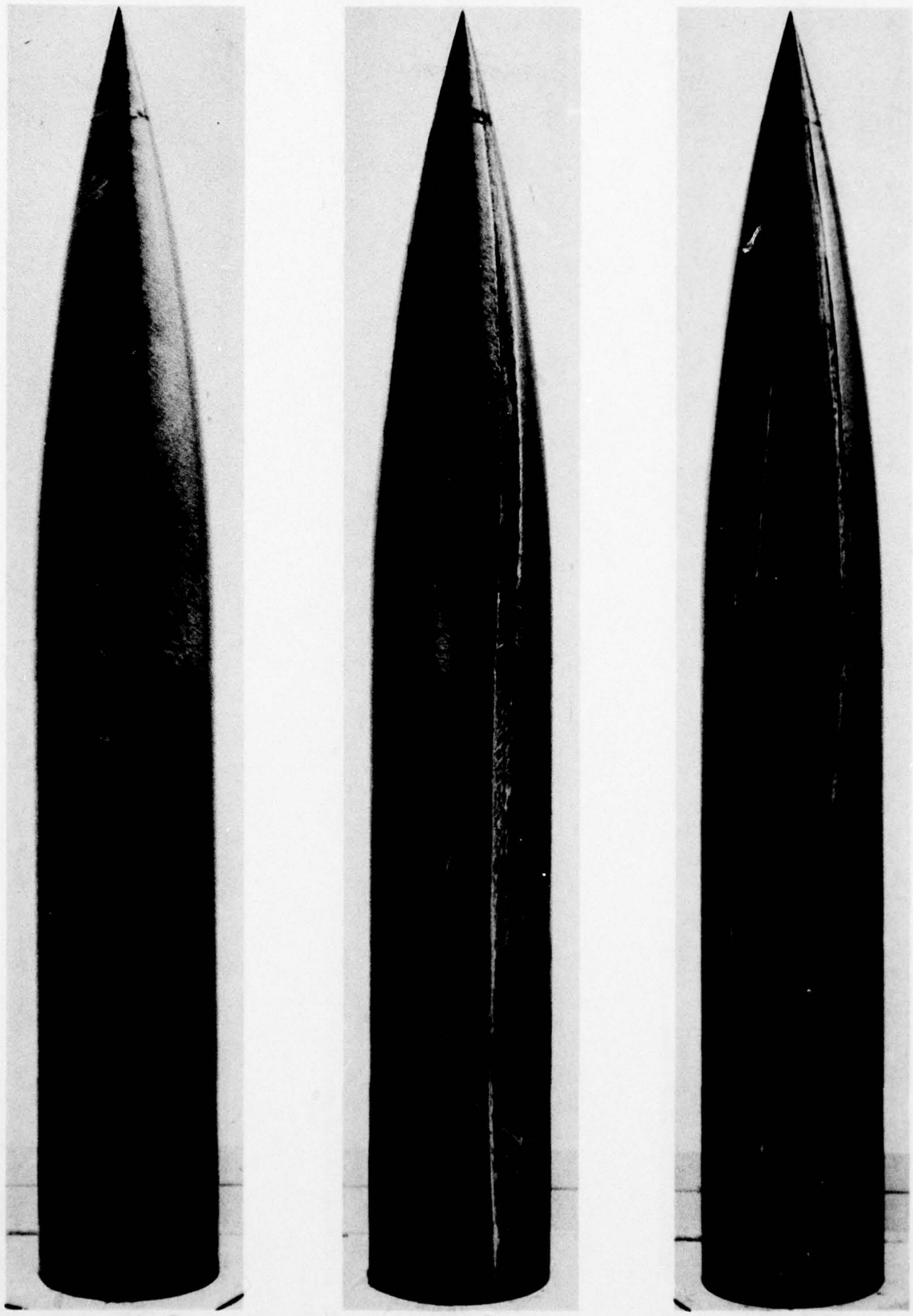
$\theta = 0^{\circ}$ 60° 120°

Figure 20.- Carbon black surface flow visualization, $\alpha = 37.5^{\circ}$; $Re_D = 0.18 \cdot 10^6$, with tape strip on nose.



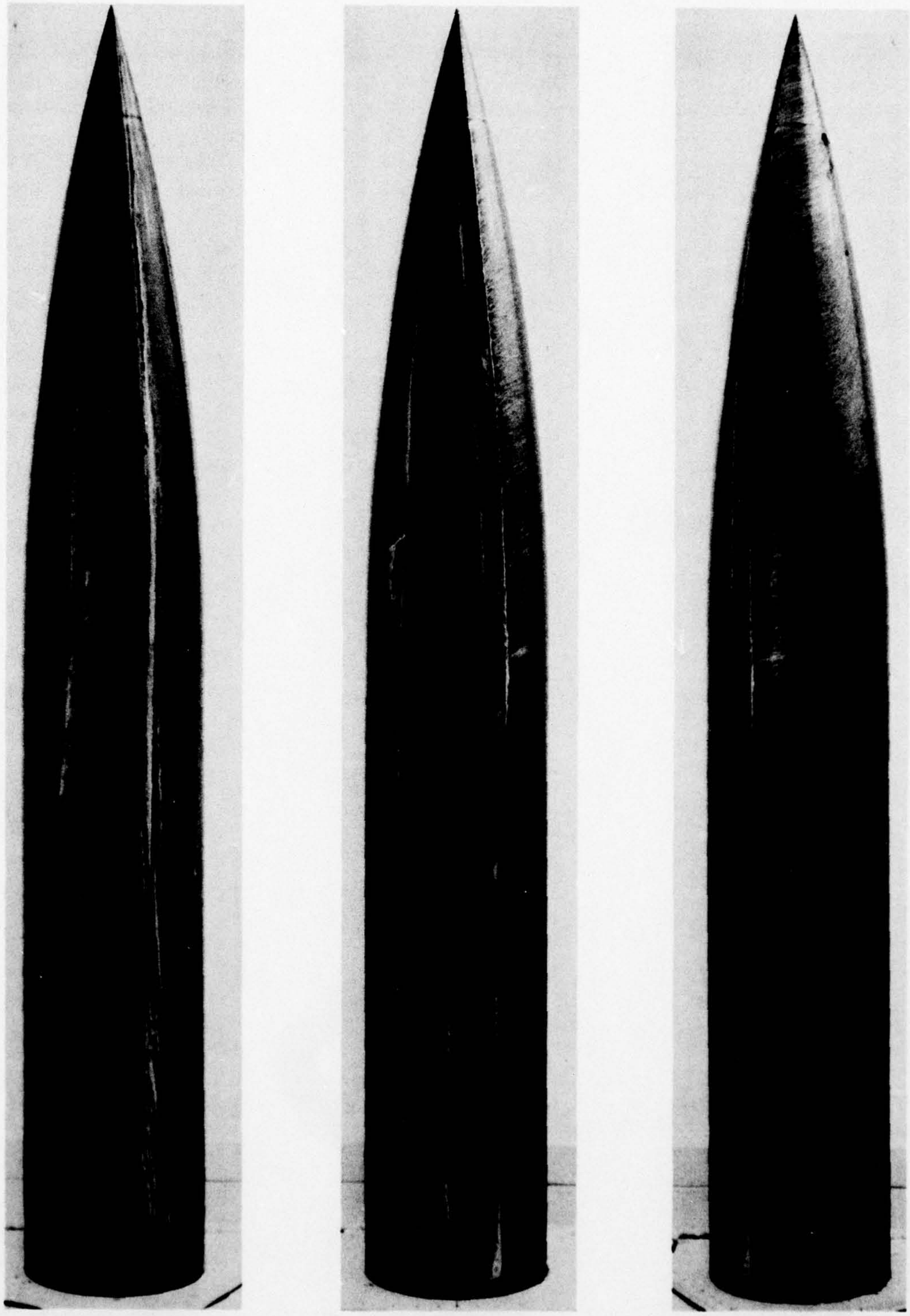
$\theta = 180^\circ$ 240° 300°

Figure 20.- Concluded.



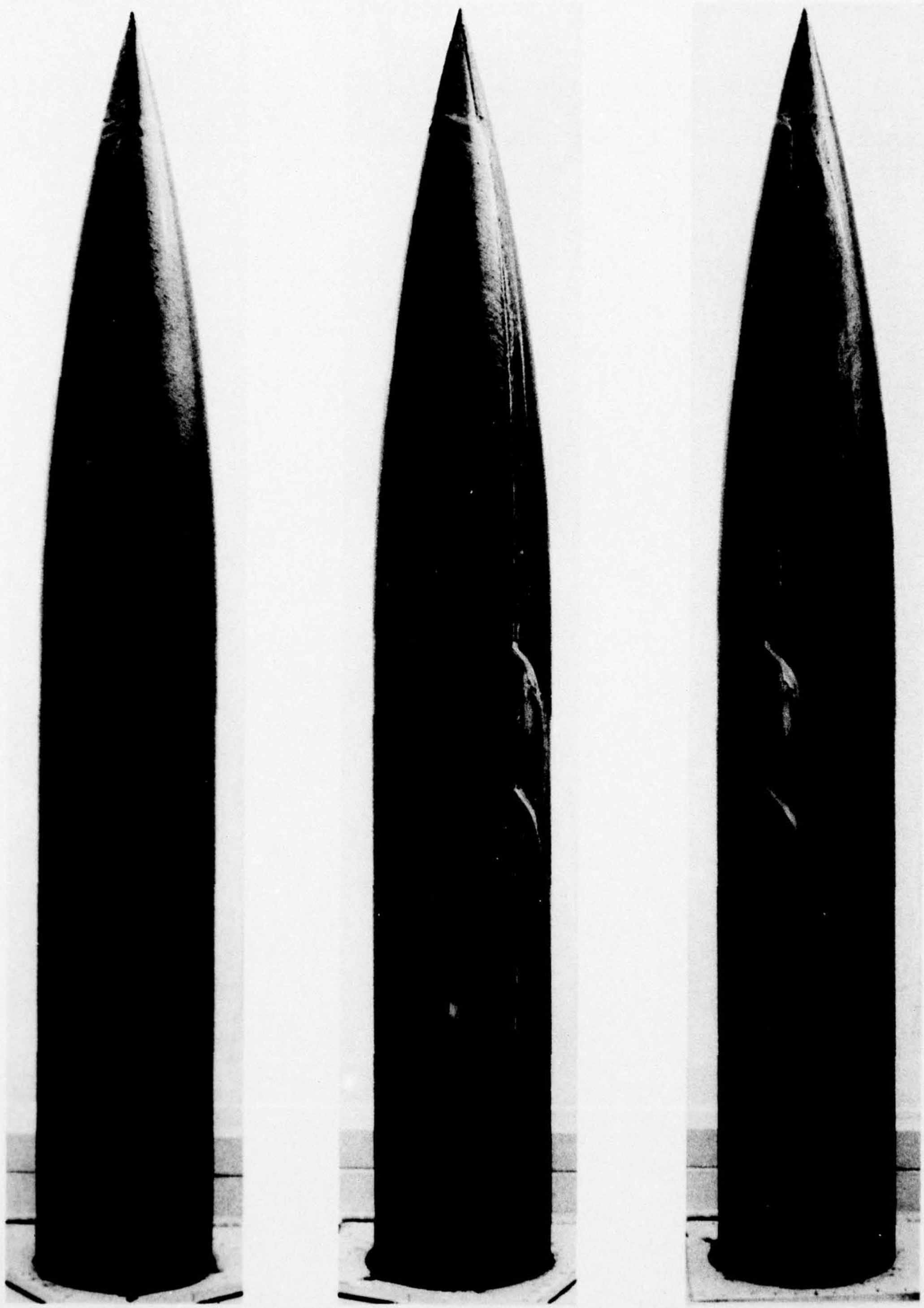
$\theta = 0^{\circ}$ 60° 120°

Figure 21.- Carbon black surface flow visualization, $\alpha = 37\text{-}1/2^{\circ}$; $Re_D = 0.37 \cdot 10^6$, without tape strip on nose.



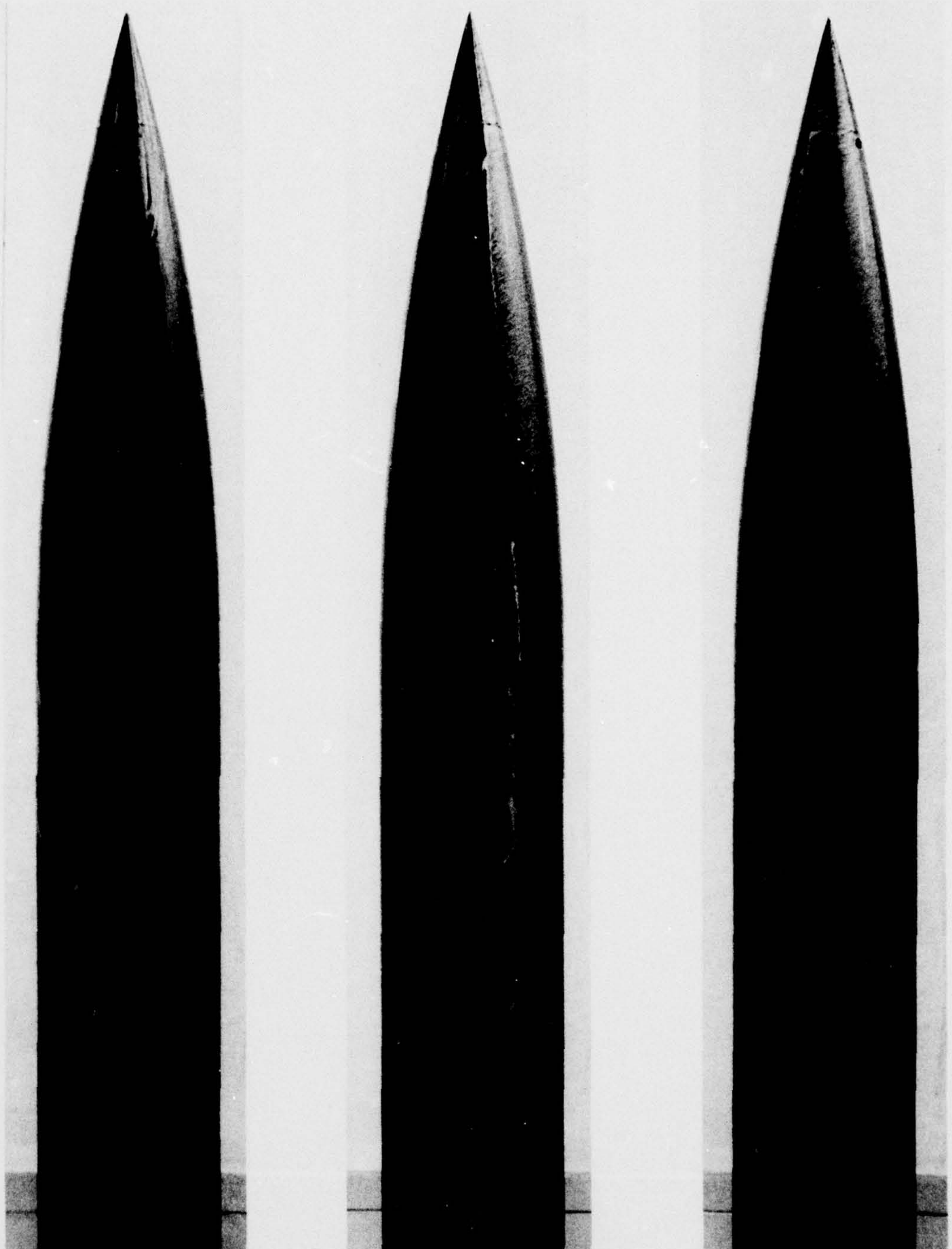
θ = 180° 240° 300°

Figure 21.- Concluded.



$\theta = 0^\circ$ 60° 120°

Figure 22.- Carbon black surface flow visualization, $\alpha = 37\text{-}1/2^\circ$; $Re = 0.37 \cdot 10^6$, with tape strip on nose. (Figures 9-18, 23 at same flow conditions)



θ = 180° 240° 300°

Figure 22.- Concluded.

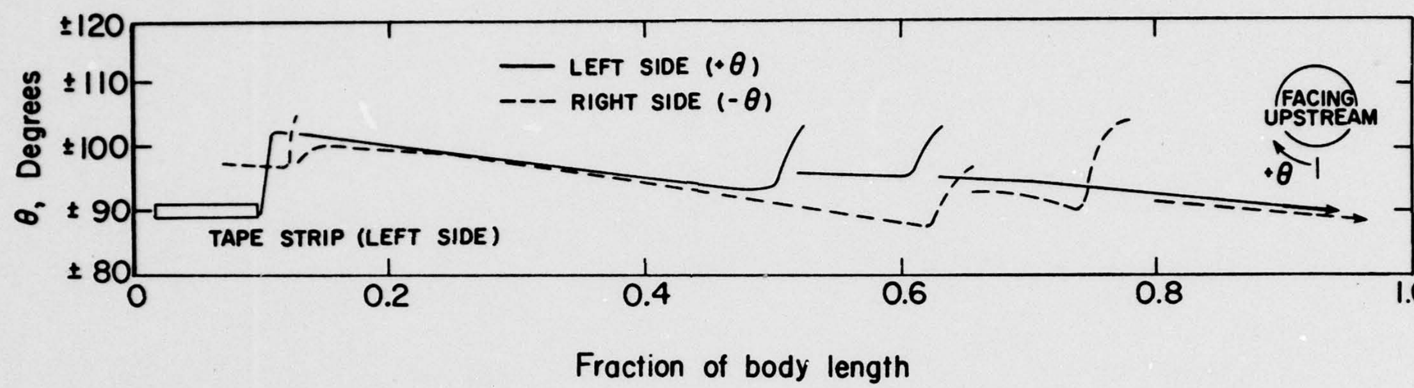


Figure 23.- Location of primary separation lines from photographs of Figure 22, $\alpha = 37\text{-}1/2^{\circ}$, $Re = 0.37 \cdot 10^{6}$, with tape strip.